AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Reg. U. S. Pat. Off.

Vol. 63 Established 1902 No. 21

NORMAN G. SHIDLE, Directing Editor

LESLIE PEAT, Managing Editor
P. M. HELDT, Engineering Editor
JOSEPH GESCHELIN, Asso. Eng. Editor
ATHEL F. DENHAM, Field Editor
JEROME H. FARRIS, Asst. Editor
HERBERT HOSKING, News Editor
GEOFFREY GRIER, Art Editor
A. B. CROFOOT, N. Y. News Rep.

Contents

All Indications Point to Larger Automotive Trade With Latin America. By Leslie Peat 745

Offset Flash Welding Die Solves Problem of Double Curvature Seam on Reo Body. By J. Geschelin 748

Just Among Ourselves 753

Independent Suspension on Crank Axles Eliminates Variation of Wheel Tread. By P. M. Heldt 754

If I Were an Engineer Today. By Fredrick E. Moskovics 757

Bijur Chassis Lubrication System is Now Automatic 759

Survey Reveals Variety of Painting Methods. By T. J. Maloney 762

Motor Cycles Follow Automobile Trend in Latest Offerings at Paris Show. By W. F. Bradley... 766

New Developments 768

Automotive Oddities 770

News of the Industry 771

Men of the Industry 772

Production Index 776

Calendar of Events 780

Advertisers' Index 88-89

Automotive Industries is published every Saturday by

CHILTON CLASS JOURNAL COMPANY

Chestnut and 56th Streets, Philadelphia, Pa.

C. A. MUSSELMAN, President and General Manager
J. S. HILDRETH, Vice-Pres. and Director of Sales
W. I. RALPH, Vice-Pres. G. C. BUZBY, Vice-Pres.
A. H. VAUX, Secretary and Treasurer
JOHN A. CLEMENTS, Asst. Treasurer

JULIAN CHASE, Business Manager Automotive Industries
GEO. D. ROBERTS Advertising Manager

Cable Address ..... Autoland, Philadelphia
Telephone ..... Sherwood 1424

OFFICES

New York—U. P. C. Bldg., 239 W. 39th St., Phone Pennsylvania 6080
Chicago—5 S. Wabash Ave., Phone Central 7045
Detroit—710 Stephenson Bldg., Phone Northway 2090
Cleveland—1140 Guardian Bldg., Phone Main 6360

Controlled by United Business Publishers, Inc., 239 West 39th St., New York; ANDREW C. PEARSON, Chairman, Board of Directors; FRITZ J. FRANK, President; C. A. MUSSELMAN, Vice-President; F. C. STEVENS, Treasurer.

SUBSCRIPTION RATES: United States, Mexico, United States Possessions, Canada and all countries in Postal Union, $8.00 per year; Foreign, $6.00 per year. Single Copies 35c.

COPYRIGHT, 1930, CHILTON CLASS JOURNAL COMPANY

Member of the Audit Bureau of Circulations
Member Associated Business Papers, Inc.

Automotive Industries—The Automobile is a consolidation of the Automobile (monthly) and the Motor Review (weekly), May, 1902; Dealer and Repairman (monthly), October, 1903; the Automobile Magazine (monthly), July, 1907, and the Horseless Age (weekly), founded in 1895, May, 1918.

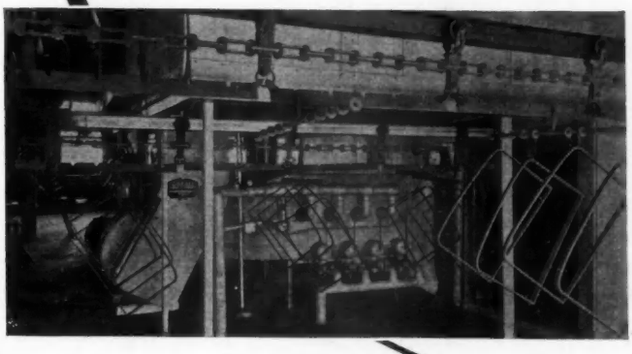
DRYING SYSTEMS INC.

Drying and baking headquarters for the AUTOMOTIVE INDUSTRY

DRYING and BAKING *at* Victor Body Company

The DRY-SYS installation in plant of Victor Body Company, Lansing, Michigan comprises two sets of ovens—one operating on steam heat, from indirect heaters, with a drying temperature of 300°, the other, indirect heated from DRY-SYS Induced Draft Heaters, gas fired, for higher operating temperatures.

This installation is an excellent example of the completeness of DRY-SYS engineering and DRY-SYS equipment for drying and baking.

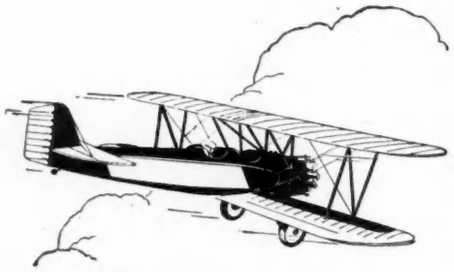


DRYING SYSTEMS, Inc.
1819 FOSTER AVE.
CHICAGO
ILL.

Send us data on process checked:
☐ Enamel baking ☐ Japan baking ☐ Varnish drying ☐ Core drying

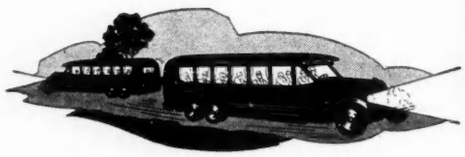
Name.....
Address.....
Town..... State.....

How long will a Battery retain its starting ability?



HARD FLYING SERVICE *requires a dependable storage battery. Exide Batteries meet all rigid flying regulations; supply continuous, reliable electric power.*

FOR A TOUR *or only a short drive, the battery plays a vital role in trouble-free motoring. Exide Batteries are specially designed to furnish steady, economical current for starting, lighting, and ignition.*



LONG NIGHT RUNS *are safer and more comfortable when lights are kept bright by Exide Batteries. The Exide Motor Coach Battery container resists mud, water, acid, hard knocks.*

THAT'S an important question in buying batteries. Experienced buyers choose Exides because they deliver a steady current dependably throughout an unusually long, active life.

For 42 years Exide has manufactured reliable storage batteries. Experienced engineers have specially designed Exides for every type of automotive job . . . to supply trouble-free, *economical* electric power for starting, lighting, and ignition in trucks, tractors, motor coaches, automobiles and aircraft.

Seventeen factory branches, three great factories, and Exide representatives in all important localities make up the vast Exide organization, which gives you prompt, interested service and easy accessibility to a complete line of reliable, economical Exide Batteries.

Exide
BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
THE WORLD'S LARGEST MANUFACTURERS OF STORAGE BATTERIES FOR EVERY PURPOSE
Exide Batteries of Canada, Limited, Toronto

AUTOMOTIVE INDUSTRIES

VOLUME 63 NOVEMBER 22, 1930 NUMBER 21

All Indications Point to Larger Automotive Trade With Latin America

by
Leslie Peat

WHAT does the changing picture of South America hold for American exporters during 1931? Before going into the study of the complexities of this merchandising field, it can be fairly stated that world exports will contribute more to car manufacturers' earnings next year than they will this year. From 335,000 to 360,000 motor vehicles exclusive of foreign assemblies and Canadian production will be exported during 1931.

Although the factors which disturb business on the other side of the Rio Grande are more complicated than those in the United States, South America as a whole is expected to react rapidly to world stabilization and indicators used in evaluating condition in Latin America generally point to considerably better marketing for next year, as compared with this year.

The Department of Commerce has found that from the low point reached in 1922, following the boom and tariff in the preceding years, the actual volume of our exports to Latin America has gone up steadily year by year to 1929. Instead of showing the erratic changes noted from this trade it is pictured merely in terms of our fluctuating dollar.

In the actual volume of our trade, even the high figures of 1920 have been surpassed, and shows that 1929 is the true peak in our Latin American export trade.

A broad view of the entire export situation will show definitely that American foreign trade has drifted from food to manufactured goods. In 1900, about one-third of our total exports were of manufactured goods. Prior to the world war this constituted one-fourth to one-third, and 1930 will show that about one-half of our total exports was manufactured goods.

But this ratio between manufactured goods and foods and staple materials has seen a far sharper increase in our trade with South America than with the rest of the world. Automobile and truck imports into Latin America have bounded up, while in many European countries they have been simply increasing. The table (1) shows how rapidly Mexico, Central America and the continent to our south have been increasing their imports of American motor vehicles.

And further, exports of automobiles to these countries from the United States, as compared with exports from other countries of the world, have shown phenomenal gains. In several South American countries the acceptance of motor trucks manufactured here is very large. Financing trucks there has been comparatively easy since banks and other financial institutions recognized their essential usefulness in promoting progress in the country.

No estimate of South American commercial activity can be made if the political situation is disregarded. Whereas presidential elections in the United States throw some qualms into general business activity, elections are frequently tantamount to revolution in many of the Latin American countries. The political outlook for next year, however, holds much more than usual hope that the import situation will not be drastically affected.

Orderly constitutional changes have been made in Mexico and Colombia and a comparatively quiet Uruguayan election is expected. Dr. Getulio Bargas, Brazil's new provisional president, has undertaken the reorganization of that government in a business-like manner, and that revolution seems about settled.

Peru has taken very well to its government, indicating that the change was a popular one. The old order has changed for a new in Argentina. The new government, it is generally believed, will mean a new era of development in that South American republic. This last revolution was practically bloodless.

The Chilean situation, for a long time stirred by rumors of revolt, has seemingly been crowned with peace. That nation has been one of the best-governed republics of the continent to our south.

The quadrennial road congress, just ended, will accelerate highway construction throughout the world. Ambitious plans for financing the extensive road programs of the Latin Americas were reported by delegates from those countries. Generally speaking, highway transportation in South America is more rapid than rail transportation. Highways are being built under the direction of engineers who have had experience, in many cases, on road programs in this country and in Europe. This, and the important fact that more stable governments are in charge of South America, indicates the broadening of motor vehicle and automotive parts and accessory markets in South America.

In many fields our inter-American relations have been clarified through a series of notable conferences in which our country has participated with Latin American nations. Many of these were unofficial or at the most semi-official conferences on problems of trade and industry.

Since the World War there have been approximately 50 of these gatherings of industrial leaders of Latin republics with our business groups. The continuation of the spirit which has brought these conferences into being is one of the most important assets in the automotive export situation today.

Whereas the tariff has caused a rift in commercial relationship between manufacturers in this country and in Europe, South American trade will feel little of the predicted adverse effect of the Hawley-Smoot schedule. Ninety per cent of our imports from Latin America are on the free list, paying no duty.

United States Share of Total Imports of Automobiles and Parts Based on Percentage of Value

Importing Country	U. S. Shown Average, 1912-14	U. S. Shown Average, 1925-27
Cuba	72.3	88.7
Mexico	54.2	98.8
Venezuela	68.1	95.8
Colombia	30.0	92.3
Argentina	10.0	90.9
Brazil	10.1	82.9

"We must remember the influence of the 'triangular' trade between Latin America, Europe and the United States, which, by balancing the greatly varied need of each industry, diminishes the likelihood of our new tariff's having any seriously unfavorable effect on our Latin American business."

Julius Klein, Assistant Secretary of Commerce.

The United States buys more than it sells from each of the South American nations, with the exception of Argentina and Uruguay. These imported commodities are so distinctive in their character, and so essential to us, that the volume of our trade has little chance of being reduced by the relatively minor alterations made in the recent tariff revision.

Examining our trade with Latin America as a whole, in the light of Department of Commerce index figures, we find that since the depression which followed the peak year of 1920 there has been an almost uninterrupted advance in the actual volume of our trade and a scarcely less steady increase in dollar value.

During the last pre-war year the United States supplied 24 per cent of the total Latin American imports, standing second to the United Kingdom and followed closely by Germany.

In 1920, the peak year, when Europe's industrial machinery was fairly under way, the United States controlled about one-half of the total, or more than twice the share of the United Kingdom, Germany and France combined. Since then our proportion of the total has fallen to about 38 per cent at the present time, although we still supply more than the aggregate furnished by all of our three leading competitors.

There is no present indication that there will be any immediate drastic change from the favorable position, because Latin America is now acquainted with American merchandise and has learned to appreciate American business methods. Important among these are rapid delivery, a service implying an interest that goes beyond placing the goods on dealers' scales, high standards of workmanship and materials on machine-made products, and those other characteristics which are associated with American merchandise.

Although 1929 was the peak year in our actual volume of Latin American trade in both import and export, commodity prices were far above the long-time trend and the volume of trade was expanding abnormally, owing to speculative tendencies rife during that period.

By the middle of the year these conditions had become critical.

There is no evading the fact that United States exports to the countries in Latin America have fallen off to the extent of nearly $175,000,000 during the first eight months of this year, as compared with the same period of 1929.

The future of our export trade with Latin America depends very largely upon their purchasing power for our products, subject to the increasing competitive resources of Europe. Many factors will affect that purchasing power. Among other changes we may expect to see is a growing industrial development in these countries to the south of us. This should increase our sale of machinery and semi-manufactured products and will in time change the character, if not the quantity, of our exports to Latin America. It is generally believed by a number of authorities on South American industry and commerce that the time will soon be at hand for the further development of motor vehicle general assembly plants in some of the more progressive of the Latin American republics.

We can probably look forward to increasingly severe competition from Europe, but there is one counterbalancing factor which may again swing the pendulum in favor of the United States. American investments in Latin America, including American loans for necessary constructive public enterprises, have proved to be a determining factor in the future of our trade. In that event, 1930 will take its place in the history of our Latin American commerce as a period of what we may call constructive recession, during which will be laid the foundation for another major movement in our Latin American trade which may well be expected to surpass the previous peak of 1920 and 1929.

Value of Automobiles and Parts Exported from the United States

(in $1,000's)

Destination	Average, 1912-14 (in $1,000's)	Average, 1925-27 (in $1,000's)	Per Cent of Increase	Per Cent of Total Imports Were Automobiles 1912-14	Per Cent of Total Imports Were Automobiles 1925-27	1929 (in $1,000's)
Cuba	302	6,365	2008	0.5	3.8	6,727
Mexico	440	9,804	2128	0.9	7.8	13,590
Venezuela	121	3,287	2617	2.3	9.9	4,619
Colombia	90	3,570	3867	1.4	7.8	3,667
Argentina	1,129	29,185	2405	2.3	19.3	53,648
Brazil	763	16,949	2121	2.1	18.8	27,969
Chile	117	2,497	2034	0.7	6.0	9,765

Offset Flash

by
J. Geschelin

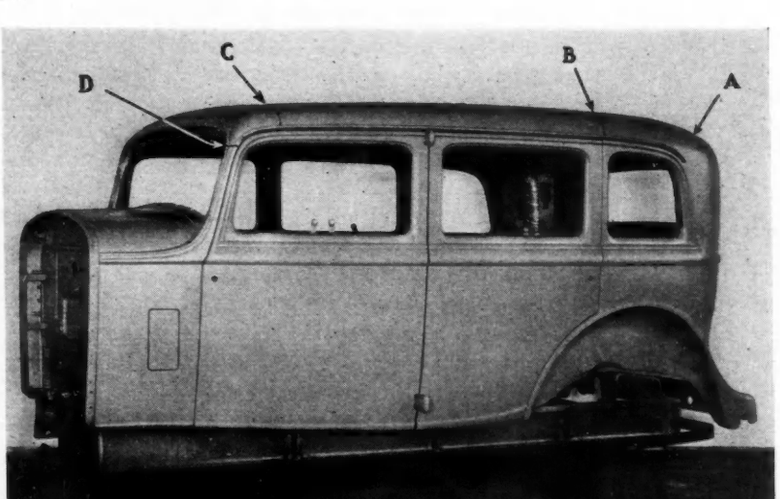


Fig. 1 (upper left)—A body for Reo sedan. The reference letters denote the welds described in the accompanying article + + + + + +

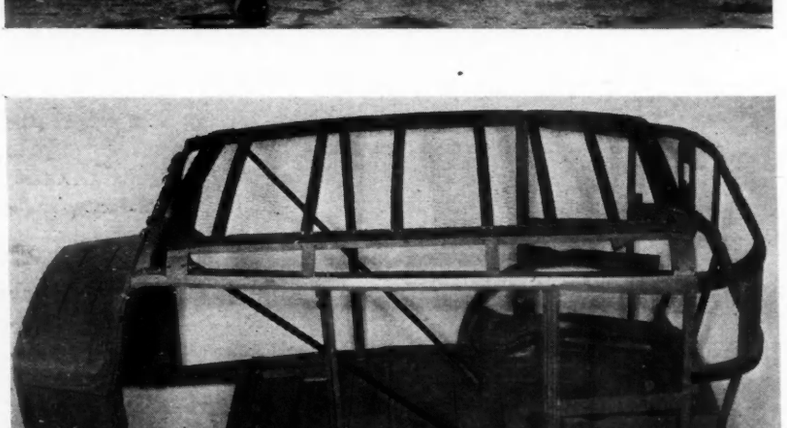


Fig. 2 (left)—The body frame is shown here ready for the assembly line

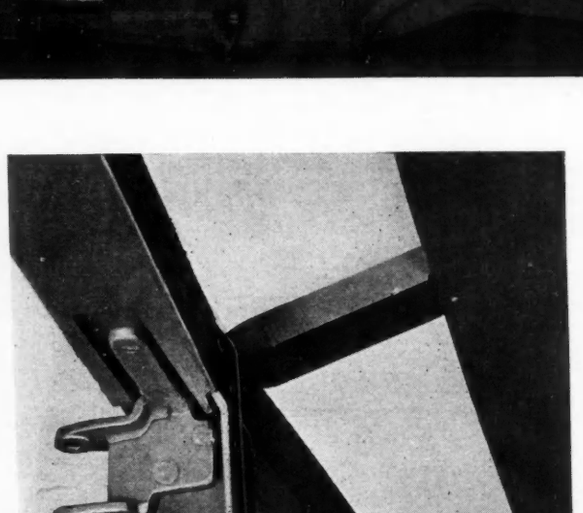


Fig. 3—Note that the upper hinge bracket is not only fastened to the T-section door pillar but to the roof side-rail as well + + + + + +

Fig. 3a—The massiveness of the joint at the sill is shown by this view of the lower hinge bracket

Welding Die Solves Problem of Double Curvature Seam on Reo Body

Elimination of glued joints and the introduction of impregnated felt at all points where weaving may occur are features of Murray body construction

BACK of the sheer beauty of line which characterizes the Reo Royale Eight body, is a distinguished record of technical accomplishment which we were privileged to study at the Detroit plant of the Murray Corp. of America. Apart from the artist-designers' work are the details and refinements in construction of the structure; the problems of die design, intensified by the introduction of difficult stampings, and the complexities involved in flash welding the rear section of sedan bodies.

Being typical of Murray construction, this is a composite body with a steel front-end structure, and a wood frame suitably braced and reinforced by steel brackets and steel stampings which will be shown in detail later. On the sedan body, which is described here, the streamlined sweeps at the front and rear have produced an interesting door construction in which both doors are hinged at the center pillar, which is a T-section steel beam carrying two hinge brackets. Probably one of the outstanding features of the sheet metal work for this body is the sedan rear center panel which demanded some intricate die work in order to produce the required double curvature-convex at the top section, concave at the lower section, the extremity of which serves as an apron to conceal the gas tank. Although it is not within the province of this article to discuss the elements of die design involved in the production of this body, several unusual details instinctively catch the eye. For instance, the trained eye of the die designer will probably appreciate the skill involved in producing the sharp, decisive lines in the belt at the front end of the front door; also the sharply defined lines at other sections, particularly the lower end of the rear center section. It is interesting to note that these lines are produced in the first forming operation.

Fig. 2 shows in excellent detail the body framing in its finished form ready for the body assembly line. As shown here the wood structure is now securely attached to the steel front end and still further reinforced, at least for the duration of some of the assembly operations, by the two long braces

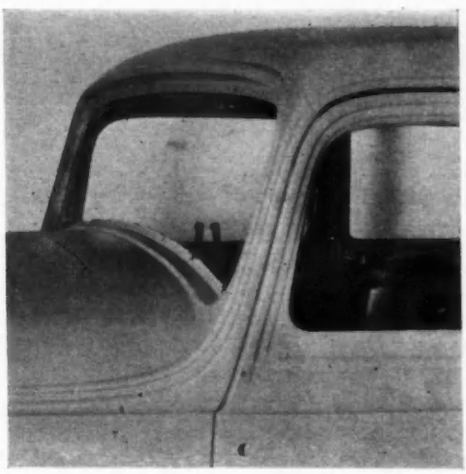


Fig. 4 (top)—This illustration shows in detail the method of fastening the roof structure to the front end + + + + + +

Fig. 4a (lower)—Here is seen the same section of the body showing the molding of the roof line after welding + + + +

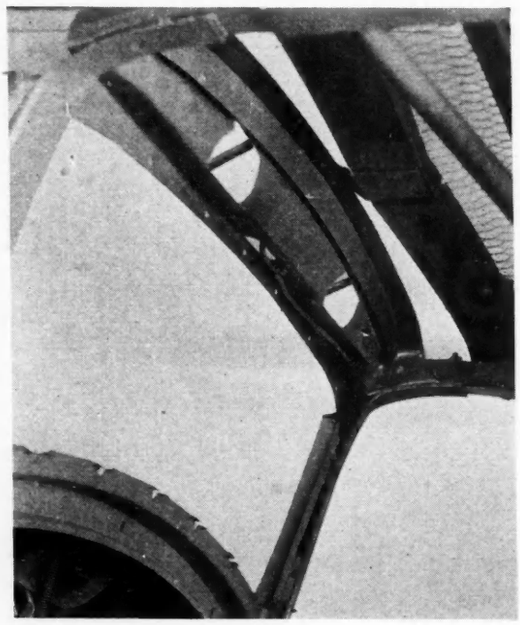


Fig. 5—The method of fastening the roof to the front end is seen in this view from the inside of the body + + + + + + + +

after assembly with a compound which acts as a wood preservative. This view also clearly shows the T-section door pillar with the hinge brackets at the upper and lower extremities.

Fig. 3 gives additional details of this pillar. Here it will be noticed that the upper hinge bracket not only is securely fastened to the pillar but also to the roof side rail thus adding materially to the strength at this section. Note also that the vertical leg of the T-pillar is rabbeted into the roof rail. The massiveness of the joints at the sill is also well illustrated by the close-up at the lower hinge bracket. Particularly interesting is the length of the rabbeting of the pillar in the sill member. Incidentally, the view at the lower section shows some of the detail of the steel front seat pan.

An intimate view of the front header construction is found in Fig. 4. The interesting thing here is the detail of the method of fastening the roof structure to the front end. The double pair of brackets fitted on the header support the concealed windshield wiper mechanism. Fig. 5 gives the interior view of the same section and completes the details of the joints at front end of the body.

Skillful welding technique is largely responsible for the subsequent finishing operations. Probably the most serious problem was the flash welding of the rear section which consists of the rear center panels and the two rear side panels. The technical problem of accomplishing this is explained by their welding engineer as follows:

"On former jobs the welding line was always straight and on a tangent plane for the full length of the weld. This, of course, was quite an ideal condition.

"However, on the Reo sedan rear paneling, this welding line had to be broken, due to incorporating the rear splash apron in the body paneling, which made it impossible to obtain parallel tangent lines for the length of the weld. This condition was particularly hard to overcome because of the fact that the welder mechanism operates on a single plane. The final solution lay in the design of the welding die, which was offset as shown in Fig. 6. In former practice the edges of the two pieces of metal always met on a line. On this particular job the die setup demanded that on the lower end of the paneling the weld started with one edge of the metal slightly below the other. As the welder dies travel toward one another during the time of fusion this condition is overcome, giving the same results as formerly."

Fig. 7 shows the completed weld with the change in direction of the seams, clearly in evidence. The accompanying sketch explains the principle involved.

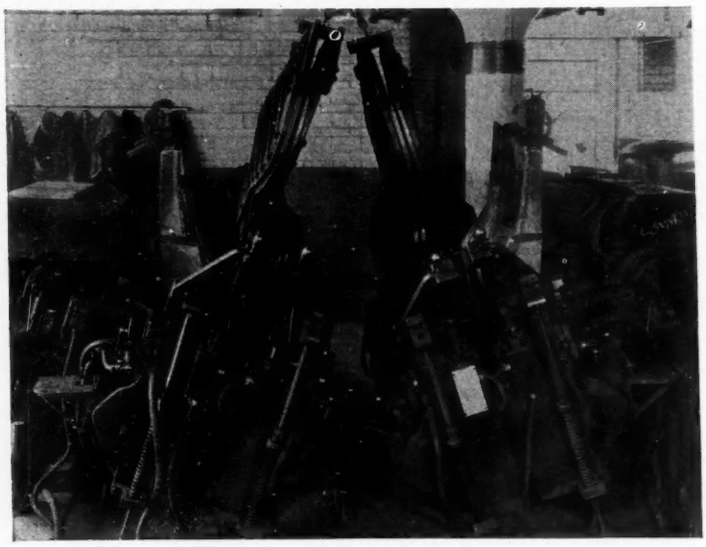
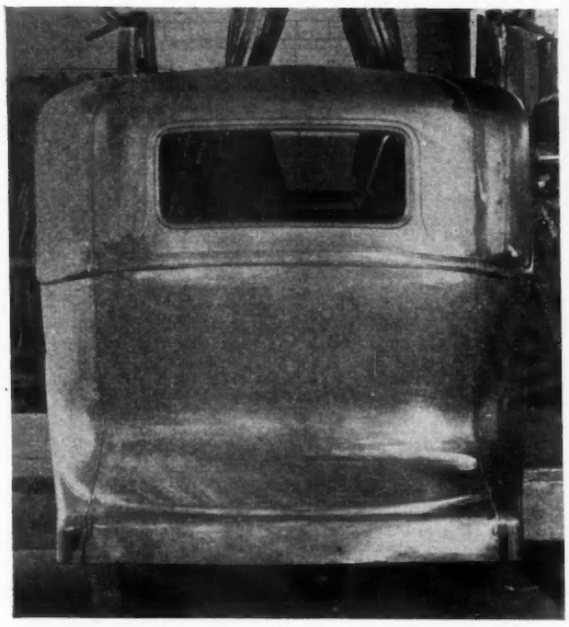
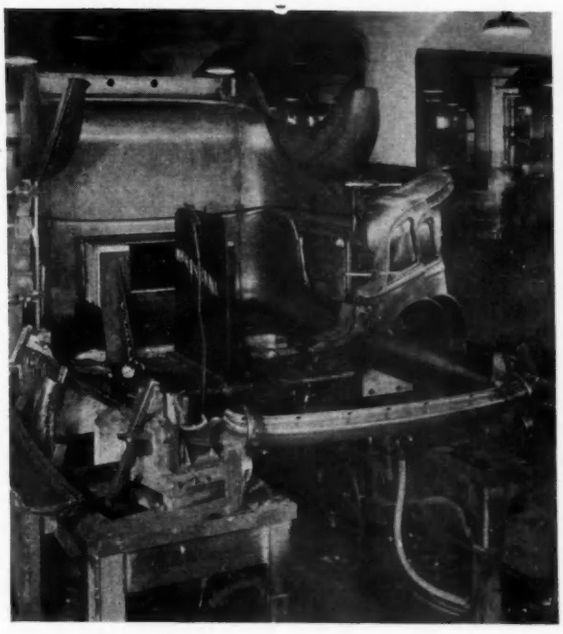


Fig. 6—The final solution of some difficult problems were found in the design of the welding dies + + + +

which serve to hold the foundation in accurate alignment. Characteristic of Murray design the sills are of hardwood with a steel kick-up and steel seat pans. The roof is of double rail, woven wire type, with the main roof rail forming the upper longitudinal tie for all body pillars.

Glued joints have been practically eliminated, joint strength being maintained by the use of steel reenforcement bedded in anti-friction paste. Between the roof bows and wire and at various other points where there is any possibility of weaving between the body structure and the steel panels, the wood sections are shielded with felt strips impregnated with a special anti-friction compound which is said to provide permanent lubricating qualities. The completed body frame is sprayed





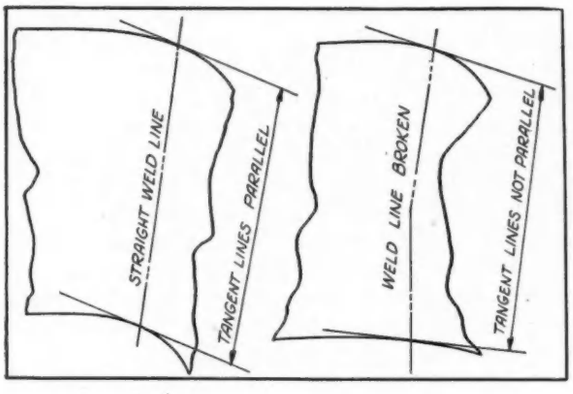


Fig. 7 (upper left)—This illustration of the rear of the body shows a completed weld with a change in the direction of the seams. The sketch below shows the principle involved

Fig. 8 (upper right)—In this fixture the two roof panels and the header panels are welded + + + + + Fig. 9 (lower right)—A heavy aligning fixture is fitted into the windshield opening during the final assembly operations

The next stage is the completion of the steel shell. In the fixture shown in Fig. 8, the rear section and the two roof panels and header panel are welded into one unit. Probably the best feature of the fixture is the insistence upon dimensional accuracy and the facility with which this is accomplished. To this end, adequate clamps and positive stops are provided so that the trained welders may fit the metal parts and align them carefully before the welding is started.

Referring to Fig. 1, *A* represents the two flash welds in the rear panels; *B* represents the joint between the side roof panel and the rear panel; *C*, the welds uniting the side roof panels and the front header panel, all of which precede operations on the body assembly line. The weld at *D*, which is the junction between the roof section and the front pillar, is the only weld made on the body assembly line. In Fig. 4A is shown a close-up view at the front pillar, illustrating the smooth molding of the roof line after the gas weld *D*. This view also shows the beautiful fairing of lines after concealing the front header details.

Along the assembly line strict precautions are taken to preserve the correct alignment of body structure, as this is the determining factor in the accurate hanging of the doors, fitting of the windshield and other details. Accordingly, in addition to the braces mentioned earlier, a heavy aligning fixture (in effect a frame, Fig. 9) is fitted into the windshield opening during the final assembly operation.

After the steel structure has been permanently fitted in place, all joints on the roof and the two vertical seams at the rear end are filled in and skillfully faired by wiping with lead.

The craftsmanship of Murray die makers is reflected in the quality and form of the intricate stampings de-

signed for the series of bodies in the Reo Eight line. Details of the body stampings given here illustrate this in a striking manner. A noteworthy feature at Murray is that their preliminary work on the die usually makes it unnecessary to do any last minute changing when the dies are put into production on the press. As we understand it, this is rather unusual and is probably due to their habit of making plaster casts of the "mock-up" body and making die patterns from these casts rather than from a working drawing. This method also gives the die maker the opportunity to study the actual developed surface of the stamping while in the plaster cast form and working out troublesome spots before the die is in its finished metal form.

Uniform Heating Necessary in Nitriding

ONE of the interesting nitriding applications is found at the Arrow Head Steel Products Co. The electric furnaces now operating in their new nitriding building at the Minneapolis Works, coupled with the equipment at the Buffalo Plant, represent what is believed to be the largest nitriding facilities in the country. Below is given a brief summary of their nitriding practice.

Steels best adapted to the nitriding processes are those containing aluminum and chromium, with molybdenum added because of its effect upon the case and core-adding toughness. Nitriding gives a hardness equivalent to 1000 to over 1300 diamond Brinell. Distortion can be eliminated with properly controlled treatment.

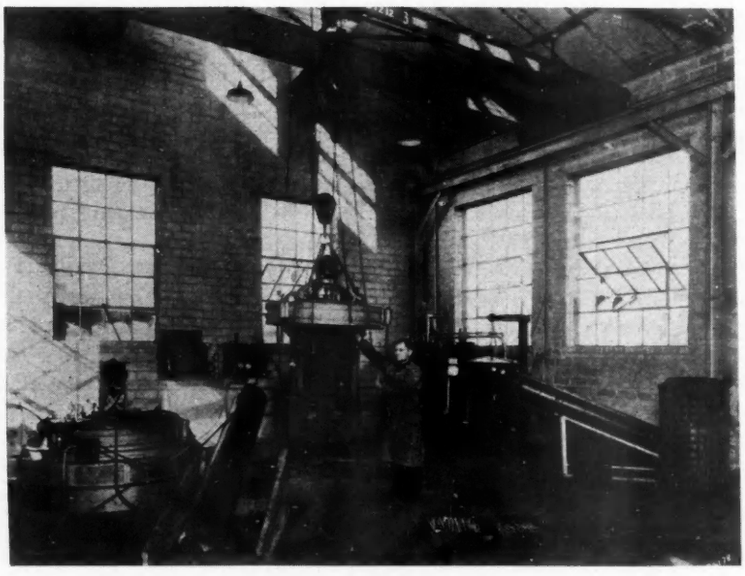
It is known that during nitriding a growth takes place. This is carefully calculated and exact allowance is made for the high finish after the nitriding process and computed to tolerances of a tenth of a thousandth. Arrow Head is finishing cylindrical shapes to one ten-thousandth for three aspects—size, roundness and taper.

Nitriding furnace practice must be given exceptional scientific consideration. Among these are absolute and uniform heat distribution, rapid and uniform circulation of the gases, as well as ease of charging, sealing and rapid handling. Some of Arrow Head's electric nitriding furnaces are set in a specially constructed pit below floor level; and large non-oxidizing containers and retorts are handled by a rapid action electric crane which runs on overhead tracks the length of the nitriding building as shown in the illustration.

In many ways the nitriding process is simple, the two chief considerations being constant rate of flow of gas, and uniform temperature—holding steadily at around 1000 degrees. Temperature is automatically controlled with alarms, safety signals and cutouts, each furnace having its own potentiometer, multiple pyrometer controls, and other recording instruments. Nitriding time ranges from 20 to 100 hours with less than a five degree tolerance in temperature variation during impregnation. Regulation of gas flow in the inlet is valve controlled, and regular and constant flow is maintained. Pressure is controlled by mercury. The rate of gas flow is observed in a bubbling chamber, which also acts as a seal. The amount of dissociation of anhydrous ammonia is measured by feeding the gas from the outlet tube into a glass pipette from which dissociation is quickly and exactly determined.

Threaded sections of steel which must remain soft are protected from the nitriding action of the ammonia gas by stannic oxide, plating and other methods.

Measuring the hardness and thickness of the nitrided case is of great importance. Because of variance in physical uses, the specifications for nitriding may vary in required hardness; but the range of hardness is above that of any file, while the depth of this hard case may be much less than produced on the better known and older alloy steels by other methods.



Large non-oxidizing containers and retorts are handled by a rapid action electric crane

JUST AMONG OURSELVES

Automotive Stocks on the Bargain List

THERE are bargains in all lines these days, but anybody with cash looking for a good automobile company to hang on his Christmas tree could certainly pick up some fine ones cheap. For only $191,000,000 he could buy control of a dozen of them—provided he didn't insist on including General Motors and provided, of course, nobody discovered he was accumulating the stock and started the price up on him.

The values that the stock-buying public is placing on automobile companies today is ridiculously small.

General Motors, with its far-flung ramifications, and including five passenger car companies, still is valued at nearly a billion and a half dollars. On the basis of Nov. 12 market prices, the judgment of stock buyers was that General Motors is worth as much as Packard, Nash, Chrysler, Studebaker, Hudson, Reo, Auburn, Hupmobile, Willys-Overland, Graham and Marmon—and a billion dollars to boot.

A Good Choice Could be Made

ON the day mentioned, $34,500,000 would have purchased a controlling interest (51 per cent of common stock) in Chrysler; less than $15,000,000 a controlling interest in Hudson; about $19,400,000 control of Studebaker; $6,500,000 control of Auburn; a little over $9,000,000 control of Reo; less than $700,000 control of Marmon, and something under $6,000,000 control of Willys-Overland.

Here are sums which sound much more like estimates of the private fortunes of the more important automotive executives in good times than like the value placed upon the vast plants, which go to make up a good share of the world's largest manufacturing industry.

By and large public estimate of motor stock values seems to have swung even farther down on the pessimistic side than was reached in excesses of optimism during 1929. Readjustment of estimates of these values seems bound to come in view of the actual values which appear from any detailed study of the place of the motor vehicle industry in the present and future development of our social and economic fabric in the United States.

C. H. Carlisle, president of Goodyear Tire & Rubber Co. of Canada, is quoted as having said recently: "I will not live to see a greater production of automobiles than in the first half of 1929 . . . ."

We'll miss our guess badly if the industry doesn't beat that production again within ten years, and without grossly overloading dealers to do it either.

Evaluations Today Are—

THERE'S no way of estimating Ford value, of course, since its stock is not on the market. The market price multiplied by the number of outstanding common shares of most of the other more important companies on Nov. 12, when the foregoing calculations were made, shows approximately the following which is printed just as a matter of interest:

General Motors	$1,446,375,000
Packard	114,375,000
Nash	69,275,000
Chrysler	67,686,000
Studebaker	38,002,000
Hudson	28,739,000
Reo	18,000,000
Auburn	12,915,000
Hupp	12,475,000
Willys-Overland	11,250,000
Graham	7,343,000
Marmon	1,333,000

Studebaker Director Big Vote Getter

STUDEBAKER director Herbert H. Lehman, just re-elected Lieut.-Governor of New York, now stands, according to the New York *World*, "by common accord as the inevitable nominee for Governor when Governor Roosevelt steps aside.

"Lieut.-Governor Lehman's run, when it is considered that the drys who voted for Carroll supported Senator Caleb Baumes, the Republican nominee for Lieut.-Governor, was even more remarkable than Governor Roosevelt's. His total vote in New York City was 20,000 in excess of Roosevelt's and his plurality 50,000 larger. Upstate his majority was only slightly less than Governor Roosevelt's over Tuttle and Carroll combined."

Our best wishes go to Mr. Lehman. Republican or Democrat we are all for having men in high places of the government who have had some personal touch with this great automotive manufacturing industry and who, consequently, are most likely to think intelligently and constructively in connection with such public problems as concern it.—N.G.S.

Independent Suspension on Crank Axles Variation of Wheel Tread

This is the fourth of a series of articles by the author on different types of independent suspension

THE difficulty of variation of the tread, which is encountered when the road wheels are mounted on half-axles capable of oscillation in a transverse plane, can be overcome by mounting them on cranked stub axles capable of oscillation in vertical planes parallel to the axis of the vehicle. The planes of all wheels will then either remain perpendicular to the plane of the chassis frame or—in the case of front wheels with "gather"—will always remain at the same inclination determined by the gather. There will be no change in tread as a result of spring action, but there will be, of course, slight variations in wheelbase.

One of the first vehicles to employ stub axles of this type was the Uppercu motor coach designed by Roland Chilton, of which a model was built in 1924, but which was never placed in production. This coach had front drive, and the rear wheels were trailer wheels. Drawings showing the arrangement of the stub axles for the rear wheels are shown in Figs. 1 and 2. The arm of the cranked stub axle is pivoted to a bracket riveted to the outside of the frame side rail. This arm is of hollow box section and has formed integral with it a hub for the pivot stud, an arm provided with a rubber block extending over the frame side rail, which serves as a rebound stop, a hub or boss into which the wheel spindle is fitted, and a spring saddle on the under side of that boss. A half-elliptic spring is used in this design, which is bolted with its middle to the free end of the cranked half-axle and whose ends bear against rubber pads on brackets fastened to the frame side rail. At the point where the cranked axle is pivoted to the

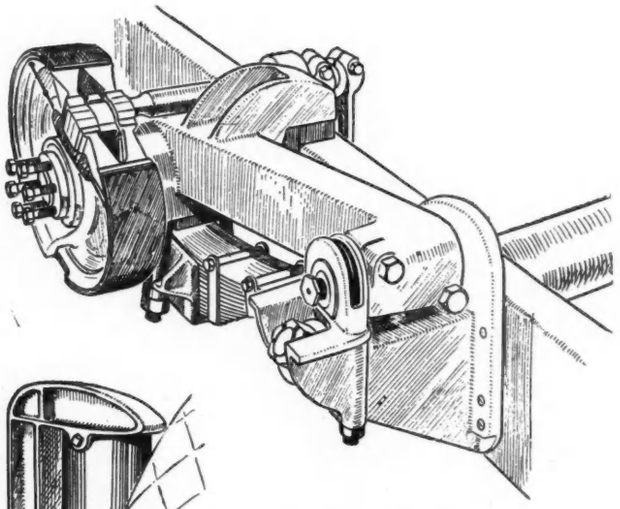


Fig. 1 (left)—Front end of rear spring of Uppercu coach + +

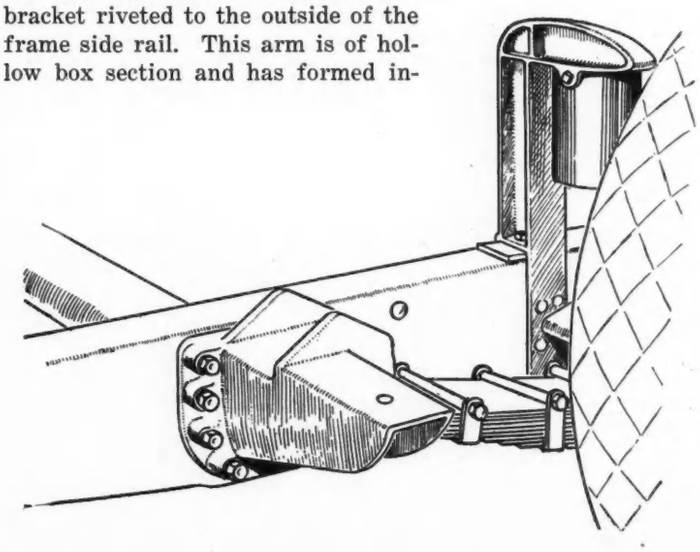


Fig. 2 (above)—Cranked stub axle (rear) of Uppercu coach + + +

Eliminates

by
P. M. Heldt

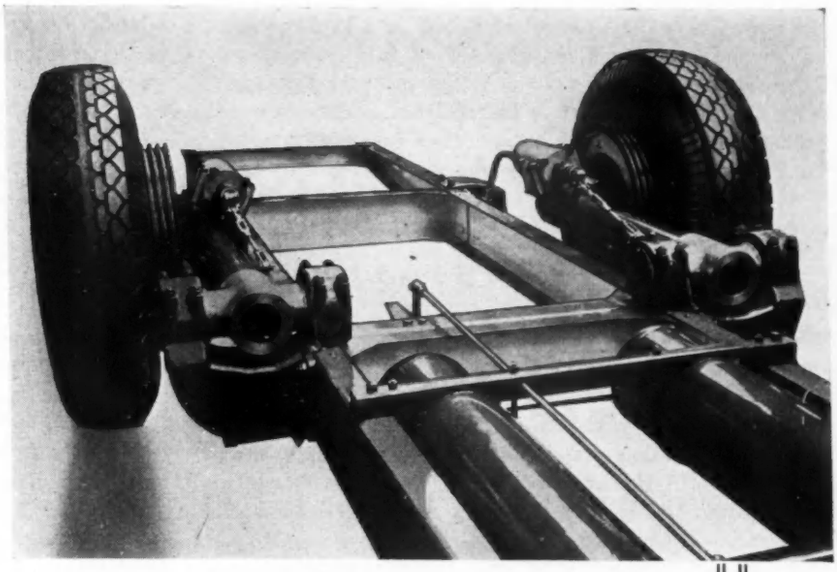


Fig. 3 — Vomag Commercial front-wheel-drive chassis with cranked stub axles (rear)

frame the latter is provided with a tubular cross-member of large diameter. While the bracket formed on the cranked axle serves to limit the rebound of the spring, a so-called spring bumper is formed by a rubber block fitted to a bracket mounted on the frame side rail, against which the free end of the crank arm abuts when the spring is heavily deflected. The general design seems to be excellent, with the possible exception that the two bearings for the pivot of the cranked axle are rather small and close together, so that the loads on these bearings probably would be quite intense. To reduce these loads the offset of the wheel center from the pivot center was made as small as considerations of wheel clearance required permitted.

A particular advantage of the absence of a continuous rear axle in a coach is that the frame side rails need have no kick-up and can be made absolutely straight, and that the floor at the rear of the bus can be placed lower.

One of the problems that arise with cranked stub axles is to provide sufficient rigidity in the transverse direction to prevent excessive sag at the middle of the frame and consequent splaying of the wheels at the bottom. There will be, of course, some yield in each of the members subjected to the load carried on the wheels, but rigidity must be assured, particularly in the arms of the cranked stub axles and in the frame in that cross-section where the bearings for the stub axles are located. The stresses on the arms of the stub axles are chiefly torsional, and these members therefore should preferably be made of tubular form, since for a given amount of material a tube has greater torsional strength than any other structural shape. Such tubular crank arms are used in the Vomag truck, the rear end of which is illustrated in Fig. 3.

The cranked stub axles are preferably supported in two bearings each, and in order to reduce the loads on these bearings they must be spaced comparatively far apart. The bearings, of course, are mounted on the chassis frame and the bending moment on the stub axles is transferred to the chassis frame through these bearings. Therefore, the frame must be made very rigid in the transverse plane at that portion of its length where the bearings are located, which can be done by providing it with a cross-member of rather deep section there.

There are various methods of arranging the chassis springs when the road wheels are mounted on cranked stub axles. In the first place, the spring may be fastened to the stub axle at the inner end of the wheel spindle as in the Uppercu design. This relieves the axle arm of load-carrying stresses, since the weight of the chassis is transferred through the spring directly to the free end of the lever arm. The arm is subjected to torsion due to the offset of the road wheel relative to the pivot bearings, and to compression or tension due to driving or retarding forces. A similar effect can be obtained by using cantilever springs of either the quarter-elliptic or half-elliptic type, the spring being mounted on the frame side rail and bearing with its free end against the free end of the crank arm. This latter arrangement has the advantage over the former that a much greater proportion of the spring weight is "sprung."

The alternate method consists in developing the cranked axles in the form of bell cranks and mounting suspension members on the chassis frame in such a manner that their movement takes place in a horizontal direction. In this case either coiled springs or air cushions are used. The characteristic of helical springs, of being capable of absorbing

about twice as much energy per pound as a leaf spring, can be readily taken advantage of in this case, since the cranked axle serves as a radius member through which the driving thrust is transmitted. Moreover, a hydraulic type of shock absorber can be readily combined with the housing and mounting members of the coiled springs. The Harris Leon Laisne chassis, illustrated by Fig. 4, has a suspension of this type.

Use of Bell Cranks Involves Difficulty

As with everything else, however, there are two sides to the question, and the system of mounting the suspension members on the frame so as to act in a horizontal direction has its disadvantages as well as its advantages. In this case both arms of the bell crank are subjected to bending moments and must be made sufficiently rigid to withstand these without appreciable yield. Moreover, there is at least one additional bearing for each stub axle on which the chassis weight (or a multiple thereof) must be taken. In practice the vertical arm of the bell crank is likely to be considerably shorter than the horizontal arm, and the load on the bearing at the end of the first-mentioned arm therefore will be proportionately greater than the wheel load.

Two of the examples of cranked stub axles mentioned happen to be used on chassis with front-wheel drive, and it appears that the construction is particularly adapted for the rear end of such chassis. That it can be used for the rear end of rear-driven chassis is proved by the Harris-Leon Laisne example. The use of axle tubes in that case would involve some difficulty, since the tubes would have to have universal connections at both ends. There appears to be really no valid reason, however, why axle tubes should be used with such a construction. In most car models the propeller shaft turns without a protective covering, and the axle shafts on modern cars are about equally hidden from view and equally inaccessible.

Some difficulty would probably be met with in any attempts to apply this method of springing to the front wheels, owing to interference between the crank arms of the stub axle and the drag link. The problem, however, could be solved by the use of a transverse drag link.

A method of suspension similar to that described in the foregoing is being employed in a number of European six-wheeled truck and bus chassis, notably the Scammell and the N.A.G. In these the axle spindles of the two driving wheels on each side are carried on double-armed levers which are fulcrumed on an axle extending across the frame midway between the rear wheels on the same side. The rear end of the chassis frame is supported on these double-armed levers on half-elliptic springs. With this construction one of the driving wheels on either side may rise and fall independently of the other. This also gives a certain transverse flexibility in that when one driving wheel passes over an obstruction, the driving wheel corresponding to it on the opposite side of the chassis is not tilted in direct proportion, though if both driving wheels on the same side are raised above the level of those on the opposite side, the latter will be tilted proportionately.

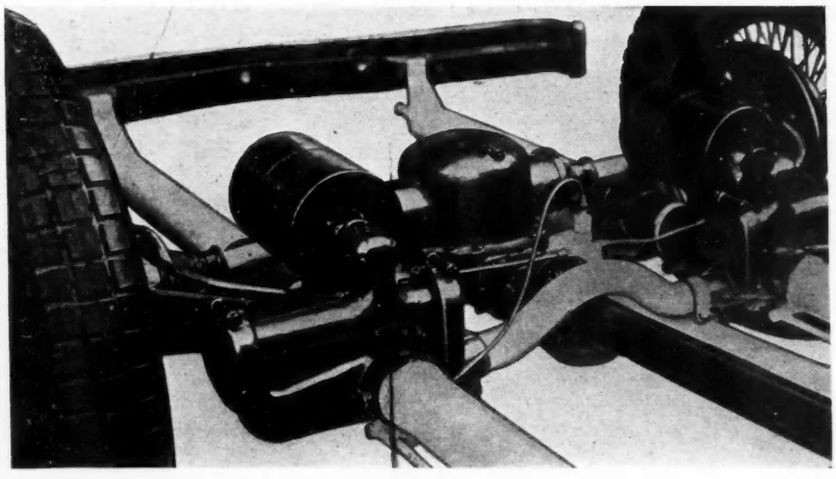


Fig. 4—Rear end of rear-drive Harris-Leon Laisne chassis with cranked stub axles

Breaking Speeds of Grinding Wheels

ONE of the chief problems in connection with the salvaging and maximum utilization of the material in grinding wheels is answered in a recent issue of *Grits and Grinds*, which is published by the Norton Co.

In an article entitled "Effects of Outside Diameter and of Hole Diameter on Breaking Speeds of Grinding Wheels," by K. F. Whitcomb, Norton Co., research laboratories, the results of formal laboratory tests are used to reach the following conclusions:

To use a concrete example, assume for a group of wheels that the structure is kept constant and the ratio of hole diameter to the outside diameter is kept constant. Then results from actual breakages of such wheels indicate that the outside diameter has little or no effect upon the peripheral speed at which a wheel breaks due to centrifugal force. Consequently, it may be said, that the peripheral velocities of two wheels with different diameters should be the same for the same factor of safety. Wheels varying in diameter from 10 to 40 in. were used in this test.

In testing for the effects of hole diameter, results from actual breakages due to speed indicate that no matter what the grain or grade of a wheel, as the hole size increases, the breaking speed decreases; consequently, when the hole size of a wheel is increased, the operating speed must be decreased.

If I Were An Engineer Today—

I would visit dealer service stations and independent repair shops and learn from each individual service man the future possibilities of my product.

He can give ideas developed by experience and constant customer contact that will prove a valuable lesson.

Says
Fredrick E. Moskovics

IF you are an engineer who really wants service information about the product you have designed, and a guide for future design, you should get out in an automobile and visit the service stations of at least some of the larger dealers who sell your cars to the public. It is surprising how few engineers do this.

And it is surprising, too, how little attention most engineers will pay to the reaction of even a good dealer service manager. Too many factory engineers, when they do contact the service man, use his suggestions merely as a basis for argument to prove that the present product is perfect and without defects. Such an attitude, of course, defeats the entire purpose of contacting these men. Service men are human like the rest of us. When they once discover that you, as an engineer, oppose practically all suggestions for improvement of the present model, they will offer very few suggestions for future products.

Yet, these selfsame service men are the very best contact points with the public that the factory engineering department has. I have talked with literally hundreds of service managers of large dealer organizations, who have never met the chief engineer of their factory. You will note I stress meeting the service man himself rather than getting the information through the factory service organization. There are several reasons for this.

When an engineer obtains field information through his own factory service department, its value is merely a reflection of the ability of the particular factory service department head properly to interpret the more or less coherent complaints of the dealer's service man. Now, the factory service manager has a multitude of duties. He is, perhaps, the hardest worked human in the entire organization. His hours are long; his troubles legion. Even with the best of cooperation on his part, it is difficult for the engineer to place between himself and the real source of this valuable service data another mind and still obtain the definite information for use in future designing which he would obtain if he personally contacted the man in the field.

Statistical records of service failures, built up by the factory service manager, are of great value to you as a designing engineer, of course. Such records should serve as a background to and a check on your personal investigations. They enable you to determine whether or not a particular trouble about which you have learned is general or local in character; whether it is a common difficulty or the reflection of the personal idiosyncrasy of one retail service manager.

But factory service statistics are no substitute for personal contact; through such contact you will learn things that never will impress themselves on you in any other way.

You will learn what your car is doing in the hands of owners. You will learn some practical facts about its performance relative to that of other cars on the local trick demonstrating hills; on the pet rough roads in Oskalusa; on that locally famous straightaway in Blank County, Missouri. You will learn

first-hand how it is standing up in service—and how customers think it is standing up, which is of equal importance.

When you go into the field yourself, moreover, you will learn more about the field performance of your competitor's cars than you ever can through testing a single vehicle or two on track and proving ground.

But, most of all, you will, if you use tact and diplomacy, learn from each individual service man his particular slant on the future possibilities of your product; you will learn all he can give of his ideas as developed by experience and constant customer contact—and, Oh, Man, what a valuable lesson that is!

It is one thing to affirm or condemn any particular type or design from a technical or academic standpoint, but actually to know first-hand what is the public reaction to that design is priceless.

Faced with greater opportunity than ever in the past, the engineer is confronted simultaneously with the necessity of *knowing* his course as never before. He is under greater stress to be able to decide correctly the proper direction to travel. To be adequately equipped for making the correct decision, he must know as much as possible about public reaction as well as about engineering technique. He needs to know from personal contact the service and public reaction to V-sixteen, V-twelve, front-wheel drives, automatic backstops, free-wheeling, four-speed gear boxes, synchronized gearshifts, power brakes, worm drives and a dozen other design features now definitely before the public.

And how better can he obtain that reaction quickly than through the dealer and independent service man who daily and hourly contacts with the driving public and yet views all these competitive features from the sympathetic viewpoint of being the engineer's own dealer?

Then, having looked closely to field contacts through the service manager, the engineer needs to keep himself well informed about contemporary thinking and developments if he is to be properly equipped to fulfill the opportunity which opens before him. But that's another story which I'll tell you in next week's issue.

Detonation Characteristics of Some Paraffin Hydrocarbons

ENGINEERS have long known that the power and efficiency of the conventional automobile engine could be substantially improved by increasing the prevailing compression ratios, but that progress in this direction is definitely limited by the tendency of present-day gasolines to knock. Although it is generally understood that there is considerable variation in the tendency of different commercial gasolines to knock, the magnitude of this variation is small as compared to that which is possible.

It was pointed out as many as ten years ago that different classes of chemical compounds exhibited widely different tendencies to knock. For example, the paraffin hydrocarbons and ethyl ether were shown to have a greater tendency to knock than substances like benzene and ethyl alcohol. More recently it has been found that large differences in tendency to knock may exist among the paraffin hydrocarbons themselves. Thus normal heptane was found to be a fuel of very low anti-knock quality in comparison with 2, 2, 4-trimethyl pentane, a fuel of high anti-knock quality. Differences in knock rating have also been reported among some of the isomeric octanes.

Wheeler G. Lovell, John M. Campbell and T. A. Boyd contributed a paper to the meeting of the Petroleum Chemistry Division of the American Chemical Society held in Cincinnati, Sept. 8-12, in which they aimed to extend the knowledge of the subject to cover 28 paraffin hydrocarbons. The work was begun in 1926 as part of a program to gather data on the detonation characteristics of pure substances suitable for use as engine fuels, which data would be comprehensive enough to establish the relationship between structure and detonation characteristics. It is believed that the data presented here form a fairly consistent picture of this kind for the paraffin hydrocarbons boiling within the gasoline range.

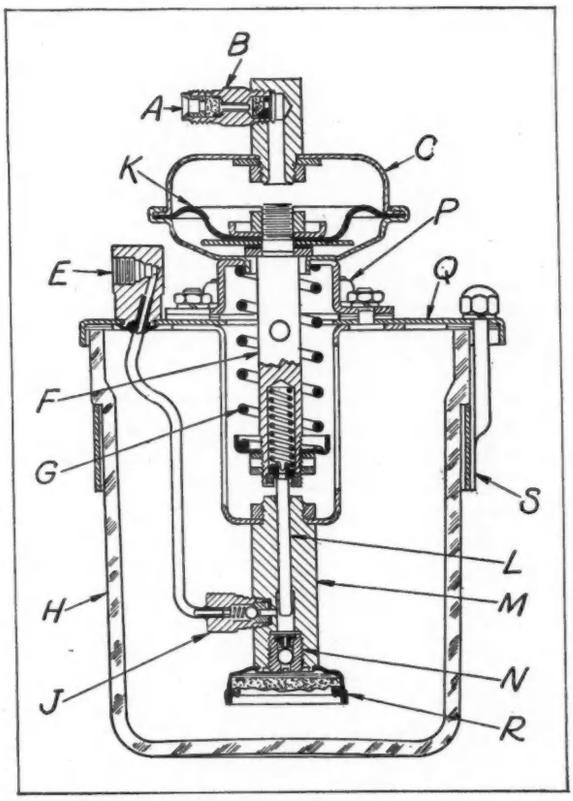
The knock ratings of these hydrocarbons have been determined in admixture with a regular commercial gasoline in the amount of one gram mol of the hydrocarbon to a liter of gasoline. These knock ratings found have been expressed on a common molecular basis, using the antiknock effect of aniline as the standard of comparison.

Upon this basis a definite relationship between molecular structure and tendency to knock has been found for these compounds. This relationship may be summarized in the statement that in a homologous series the tendency to knock increases with the increasing length of the carbon chain, and in an isomeric series the tendency to knock usually decreases as the number of side chains is increased. The successive introduction of methyl groups into a carbon chain of given length also decreases the tendency to knock.

IN his presidential address to the British Institution of Automobile Engineers Sir Herbert Austin said in a taxicab operating in congested areas the engine should be placed in the rear, for many practical reasons; this would give a sensible and convenient means of entrance and exit, and better riding qualities. He said he looked for early developments in this direction.

Bijur Chassis Lubrication System Is Now Automatic

Pump and reservoir form a unit operated by vacuum from the inlet manifold



Type GV has a glass reservoir

A—To the intake manifold. B—Vacuum regulator. C—Diaphragm housing unit. E—Outlet to chassis line. F—Diaphragm shaft. G—Diaphragm spring. H—Glass oil reservoir. J—Pump outlet valve. K—Diaphragm. L—Pump piston. M—Pump body. N—Pump inlet valve. P—Filler cap. Q—Cover-plate assembly. R—Felt filter assembly. S—Mounting bracket

A NEW system of automatic chassis lubrication which relieves the driver of the task of periodically depressing a pump lever with his foot as was required by the old system, has been developed by the Bijur Lubricating Corp. of New York. The system, moreover, is self-adjusting for changes in driving conditions and is claimed to provide each chassis bearing with the proper amount of oil regardless of whether the car is being driven in heavy traffic or on the open road. The only attention required by it consists in refilling the reservoir every few months. The amount of oil in the system may be quickly ascertained at any time by a glance at the glass reservoir, or at the level gage provided when a metal container is used.

The system is quite simple in design and comprises three major parts, as follows:

The lubricator unit consisting of an automatic pump and oil reservoir containing all of the working parts.

A system of piping to distribute oil to the several bearings.

Drip plugs located at the bearings to meter a predetermined amount of oil to each bearing.

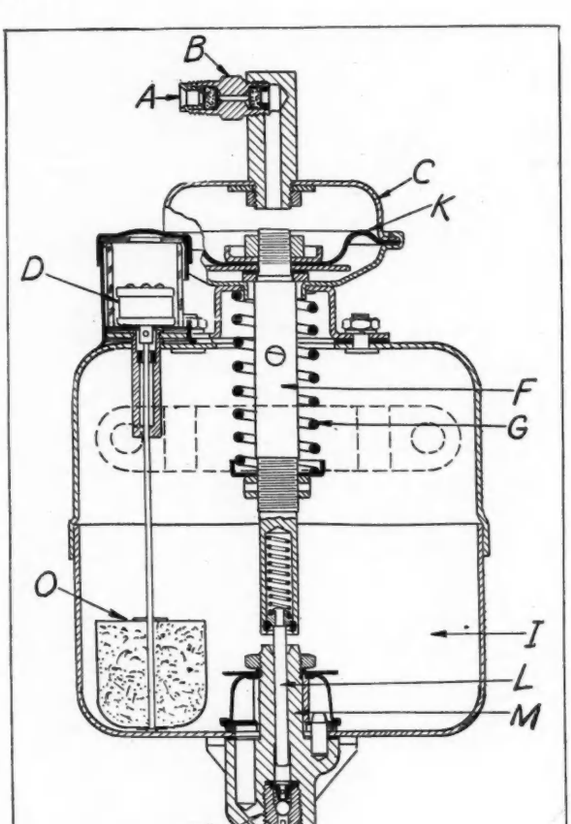
The lubricator unit is mounted on the engine side of the dash in any convenient place. In the Type GV with glass oil reservoir it is bolted to the dash with a steel bracket which supports the glass bowl. A cover plate to which the pump unit is fastened is held firmly against the upper edge of the reservoir by nuts on lugs fastened to the supporting bracket.

The automatic pump comprises a long, small-diameter piston which affords an oil seal without packing. It is provided with self-contained inlet and outlet valves, each composed of a ball pressed against a conical seat by a small spring. From the outlet valve at the side of the pump cylinder a pipe leads to the outlet connection mounted on the cover plate. Oil is admitted to the inlet valve in the bottom of the pump cylinder through a removable felt filter backed by a fine mesh brass screen.

The pump-cylinder unit is bolted to a "U" strap depending from the cover plate; these parts are permanently secured together and form a sub-assembly.

The pump piston and its actuating diaphragm constitute another sub-assembly. The upper end of the pump piston is provided with a universal joint which connects it to the diaphragm shaft, which in turn is bolted to the underside of the diaphragm. The diaphragm is urged downward against a stop by a large-diameter open-wound helical spring, and the upper side of the diaphragm is connected to the engine intake manifold by suitable copper piping. The vacuum in the manifold tends to draw the diaphragm upward against the pressure of the spring, and causes it to assume a position intermediate between the top and bottom of its travel. Variations in the amount of this vacuum cause movements of the diaphragm, thereby operating the pump. An air vent in the bottom of the diaphragm chamber permits unimpeded motion of the piston, except for the resistance of the lubricant being pumped.

The pump piston has a diameter of 5/32 in. and



Type MV is a steel shell unit

A—To the intake manifold. B—Vacuum regulator. C—Diaphragm housing unit. D—Oil-level indicator. E—Outlet to chassis line. F—Diaphragm shaft. G—Diaphragm spring. I—Oil reservoir. J—Pump outlet valve. K—Diaphragm. L—Pump piston. M—Pump body. N—Pump inlet valve. O—Oil level float

a maximum stroke of ¼ in. The spring pressure averages about 18 lb., and this would permit of a very high operating pressure, but the actual working pressure is controlled so as not to drop below 1 lb. per sq. in. in summer and not to exceed 80 lb. per sq. in. in winter. The variation in pressure is due to the changes in viscosity of the oil with changes in temperature.

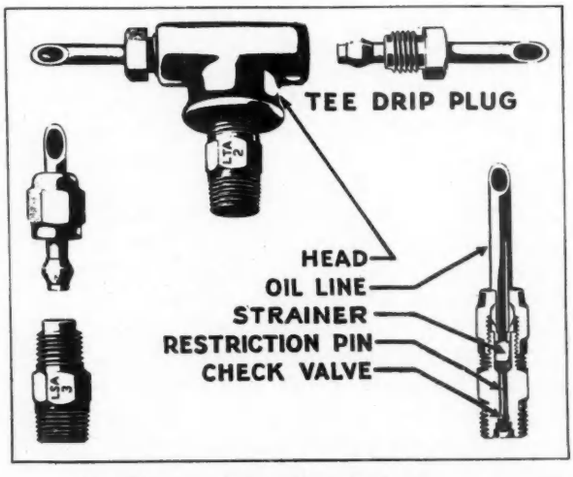
In ordinary road driving there occurs an almost continuous change in manifold depression, due to throttling changes, so that the vacuum in the intake manifold is represented by a wave with peaks and hollows. These waves are comparatively long, measured in time units, and the diaphragm ordinarily follows them closely. However, under conditions of heavy traffic, changes in manifold depression occur more frequently and are of greater magnitude. In order to limit their effect on the diaphragm and reduce it to approximately the same as that obtaining under average road conditions, a regulator is introduced between the manifold and the upper diaphragm chamber. This vacuum regulator comprises a restriction formed by a pin fitting in a hole with a predetermined clearance. The regulator is a sealed unit, and entry of dirt into it is prevented by felt filter wads suitably held in place at each end. The resistance of the regulator is varied to suit each car model. A higher resistance lowers the pump delivery and vice versa, but no change of regulator should be made unless there is a very definite reason for increasing or decreasing the oil supply.

The diaphragm-piston unit just described is fastened to the cover by two nuts threaded over studs projecting from the cover. These clamp the unit down against a gasket. The diaphragm is contained in a sealed case and the pump unit is entirely self-contained. Both are non-adjustable.

GV Type Has Glass Reservoir

The Type "GV" lubricator is provided with a glass bowl reservoir which permits convenient inspection for oil level. This bowl is supported by the mounting bracket and is provided with a smooth upper edge on which the cover plate rests. A cork gasket is enclosed between the cover plate and the upper edge of the bowl, and an oil-tight engagement is secured with very light pressure on the hold-down nuts attached to the mounting bracket. If the bowl should be broken by accident, it is necessary only to disconnect the manifold line and the connection to the chassis lines, and after the four holddown nuts are removed, the cover plate may be lifted off and a new bowl dropped in place in the mounting bracket. The bottom of the bowl is flat, so that it will stand upright on a bench, etc.

Oil in the bowl can be pumped out to the very bottom of the pump unit, but it is desirable to refill before that level is reached. The capacity of the bowls, therefore, has been so fixed that a rated pint size will receive a pint when the oil is down to the level of the outlet valve; and, similarly, the quart size will receive a quart. Filling is accomplished by removing the filler cap on the cover plate. The bowl should not be filled to a level above the top of the supporting bracket, as a higher level of the oil in-



Drip plugs are located at the bearings to supply a predetermined amount of oil to each bearing

creases the tendency of the oil to splash and creep along the bottom of the cover.

From the foregoing description, it will be seen that the output of the lubricator is independent of all conditions of vacuum change and of other influences, except those of ordinary driving conditions. Changes in temperature, in the viscosity of the oil, and in the back pressure against which the oil is delivered have little effect. In summer this back pressure is only a pound or two, but in winter, it may rise to 50 and even to 75 lb. per sq. in.

The pressures of the spring and the diaphragm are so held that the effective back pressure on the small pump piston is of little consequence, unless an incorrect oil is used. An incorrect oil may congeal and give rise to excessive back pressures, or may have other characteristics which adversely affect the operation of the system. For this reason the Bijur Lubricating Corp. recommends certain oils for summer and winter lubrication.

The delivery of the pump for a full stroke of ¼ in. is three to four drops, but this has little to do with the working output which is dependent upon a great many very short strokes in addition to a few nearly complete ones.

Automatic lubricators with steel shells instead of glass bowls are furnished when desired. The operation of these lubricators is identical, but slight differences in construction are made necessary by the difference in materials.

Type MV Has Steel Shell Reservoir

In the steel shell lubrication (Type MV) the diaphragm-and-pump unit is similar to that just described; however, the pump body is located in the bottom of the steel shell and the inlet and outlet valves are differently located. This permits the outlet to be at the bottom of the lubricator while the manifold connection remains on top of the diaphragm chamber. The oil level is shown by a visible indicator.

The piping system employs a minimum amount of tubing. The layout is such that a single line conducts oil from the lubricator to the bearing farthest from it, and suitable branches from this line supply intermediate bearings. The tubing employed is commercial annealed copper, although brass or aluminum tubing of proper specifications may be used.

Drip plugs used with the automatic systems are of the low-pressure type; that is, their valves are very sensitive to pressure changes, opening at very low line pressure and closing at the least indication of return flow. The flow of oil through the drip plug is controlled by the clearance between a very accurate pin fitted in a very accurate hole. Six different sizes of pins give a range of flow rates to take care of the requirements of the various chassis bearings. At the entrance to the metering passage is a small felt strainer, held in place by a cup of fine wire gauze. This strainer prevents the entrance of any chips or dirt which may have been in the lines when they were assembled. The metering passage is thus protected against dirt, and the proper flow rate through the drip plug is maintained indefinitely. Beyond the metering passage is a check valve which opens when slight pressure is put on the lines. As the lines are always maintained full of oil, flow to the bearings is thus permitted as soon as the automatic pump begins to operate. The valve is very sensitive to any change in direction of flow and will close immediately to prevent return flow. This is important in preventing air from entering the system at some high point and permitting oil to drain from a low point while the car is at rest.

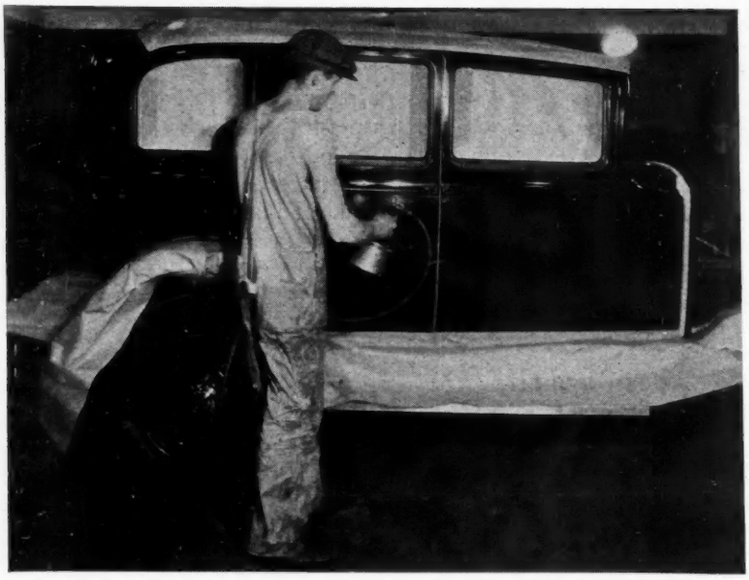
Bath Cylinder Gage

THE Bath cylinder gage, which has been adopted by a number of automobile manufacturers as the primary gage after honing, is illustrated here. In principle it involves the use of the Bath internal micrometer which is completely described in their catalog No. 12. Because of the weight of this instrument, a ring is provided at the upper end to facilitate handling. In fact, we are told that on some installations the tool is counterweighted for this purpose. Dial graduations near the center of the micrometer are 0.010 in. apart and provide a total range of 0.100 in. The dial on the knob end is graduated with divisions which are 0.001 in. apart and finer graduations which are 0.0001 in. apart. A simple adjustment in the handle enables the operator to keep the tool in correspondence with the master reference ring.

The Bath cylinder gage adopted by several manufacturers + +

One of the most important features of this gage is the special selective assembly method which it provides. Looking at the knob end, a number of long divisions will be observed about the zero line. These divisions may be marked with a key number or key letter to designate cylinder bores coming within certain definite tolerance limits, and cylinders coming within these divisions are steel stenciled with the particular key. In a similar manner pistons are measured and marked with the same key letters, thus facilitating the meeting of pistons and cylinder bores.

According to a recent publication of the Statistical Department of the German Government, the proportion of imported to all motorcycles in use in Germany decreased from 11 per cent in 1928 to 10.5 per cent in 1929 to 8.3 per cent in 1930; the proportion of imported passenger cars to all passenger cars in service increased from 19.8 per cent in 1928 to 23.2 per cent in 1929 to 25 per cent in 1930, and the proportion of imported motor trucks and delivery wagons to all such vehicles in service increased from 18.4 per cent in 1928 to 21.3 per cent in 1929 to 28.0 per cent in 1930. The figures apply to July 1 of the respective years.



The spray is not only necessary for speed but is also a fine finish essential

Survey Reveals

by
T. J. Maloney
The New Jersey Zinc Co.

The setup for finishing automobile bodies in all shops is about the same

SINCE ferrous metals are the basis of automotive production, protective coatings to preserve them are elemental. Since appearance—in the showroom and later—is such an important factor in sales, the color and life of these protective coats assume importance second only to mechanical performance. Paint (used as an inclusive term for lacquer, enamel, etc.) its selection, application and improvement is a distinct step in automotive production.

Frames and rear axle housings must be protected not only in use, but also in shipping, since a majority of both are manufactured by firms specializing in these products. For example, The A. O. Smith Co. in Milwaukee must ship most of its production to Detroit and assembly lines all over the country. In the frame plant production can be speeded to 10,000 frames a day. Painting and drying is a direct part of the continuous system. The frames come through the washing unit, are then dried, and finally move by gravity to the loading station of the painting machine where they are sprayed with black enamel. A spray of one coat is all that is necessary. The conveyor chain on the painting machine is about 700 ft. long and passes through a two-story oven. Each frame on the chain is baked for 60 minutes. They are loaded on open gondolas, the coat of enamel their only protection. The frames may be given an additional coating before they go on the assembly line, but this is not considered necessary in most plants.

At the Budd Wheel Co. Detroit plant, truck wheels are finished in practically the same way. So are motors in most plants. Painting is reduced to its simplest and most efficient form on all parts where protection is its only function. The contrast between this setup, and the body finishing setup, as shown later, could not be more marked. In the tractor plant of The Allis-Chalmers Co., the entire tractor receives a similar treatment. The tractors are spray finished at the end of the assembly line. One coating of a Persian orange lacquer, and eight minutes on the line at this point. Then an hour in the drying oven, and the tractor is ready for shipment. One feature of this oven is very interesting—a curtain of cold air at the entrance and exit serves in lieu of doors.

At the Budd plant in Philadelphia, there are certain precautions taken in the fabrication of the body to insure a metal surface which will aid the finisher. The grinding which follows all flash welding is done with great exactitude to assure a smooth surface. Indeed, this is true of all grinding. All body parts are then given an oil emulsion for protection and shipped knocked-down in enclosed cars. This oil casing is easily removed in a cleaning bath before the parts are assembled and set on the finishing line. Practically nothing but experimental work is done on body finishing.

In a recent number of *Automotive Industries* (June 21, 1930) appears an excellent detailed summary of the forty-six operations the Pierce-Arrow body receives. The setup in all shops visited by the writer was about the same, only minor variations being noticeable. The brief outline of the procedure on all Stude-

Variety of Painting Methods

Striping machines take the place of the hand striper on some parts of the body + +

baker bodies, which includes both degree of heat and time in the ovens, is also typical of the extreme care taken in body finishing.

There are at least 30 operations which all Studebaker bodies must undergo to give them their brilliant, durable finish.

The steps outlined herewith do not take into account the numerous inspections at every point. The last inspection is most critical of all, for a detailed examination is made under the glare of powerful electric lights that serve to accentuate the slightest irregularity. If the finish does not measure up to Studebaker's rigid standards it is rejected.

Certain bodies (broughams and those to be mounted on The President chassis) undergo even more operations than those described. For instance, they are given two extra coats of surfacer and a tint coat. Then they are waxed on top of the final polish.

To the visitor, the tieup between modern efficiency and skilled handicraft is an interesting sidelight. Everything is automatic and works like clock work. But once the cleaning and polishing begin, it is painstaking handiwork—rubbing, finishing, and sanding —actual craftsmanship.

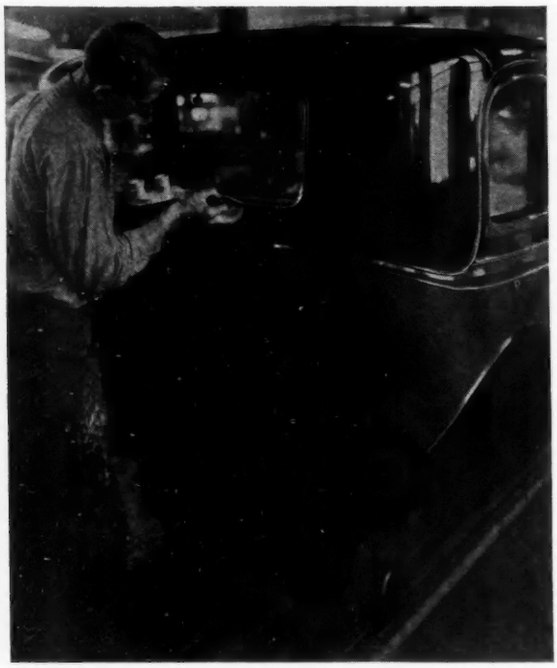
Speed, the new industrial essential created by the automotive industry, made everything used by the industry quicken its step. Old paints offered as much resistance as any of the obstacles to speed, but research within the industry and on the part of the finish manufacturers created the quick-drying finishes so essential today. The story of the demand which created quick-drying finishes is too well-known to repeat here.

Lacquers and the so-called four-hour enamels are the essence of speed, introduced to improve antiquated methods. Striping machinery takes the place of the accurate hand striper — although certain portions of the line still call for free arm movement. The spray gun was primarily a speed attribute—today in body work it is also a fine finish essential. Masking the body will doubtless pass with the invention of an instrument so accurate in directing the flow of lacquer that the mask will be unnecessary.

Fenders, due to the contour which allows enamels to drain off easily, can be dipped instead of sprayed. There are certain obvious advantages of dipping, primarily those of labor saving. All automotive body plants have circulating systems with constant agitation for their finish materials, so that the fluidity and application properties are always details under control.

Thirty Operations Are Required at Studebaker to Produce a Good Finish

1. The steel stampings are filed and buffed to a smooth surface.
2. Inside surface of the body coated with soundproof emulsion.
3. Outside cleaned by special spray-cleaning process.
4. Body baked for 30 min. at 200 deg. Fahr.
5. Body mechanically brushed to remove dirt and cleansing agent.
6. Body thoroughly washed with alcohol.
7. First priming coat with oil base applied.
8. Body baked at 180 deg. to 200 deg. Fahr. three hours.
9. Dry sanding smooths finish and putty glaze builds up slight irregularities.
10. Two coats of surfacer applied.
11. Surface coats dried by baking.
12. Body surface smoothed by water sanding.
13. Drying kilns remove all moisture.
14. Entire surface cleansed with clean rags and benzine.
15. "Intermediate primer" seals up any surface porosity and acts as a lacquer binder.
16. To the ovens again for drying.
17. First finishing coat of lacquer applied.
18. Three double coats of lacquer on belt molding.
19. Kiln dried.
20. Sanded below molding.
21. Three double coats of lacquer below molding.
22. Kiln dried.
23. Sanded above molding.
24. Three double coats of lacquer above belt molding.
25. Kiln dried.
26. Entire body oil-sanded.
27. Body treated with fine mist spray of lacquer and reducer.
28. Polishing treatment.
29. Contrasting molding and striping applied.
30. Final polish with sheepskin buffers.



The tieup between modern efficiency and skilled handicraft is notable in the paint shop at Studebaker + + +

Interior panel work—dashboards, moldings, frames, etc.—are done in so many ways that a diversity of finishing processes are required. If the colors are plain, they may be sprayed, dipped or brushed on, and any quick-drying oven or air finish applied. If they are imitations of wood, color and graining, the last coats are brushed and grained by skilled craftsmen, or else reprinted from a grained roll, somewhat in the method of offset photography. The recent introduction of crystallizing lacquers, which take forms similar to frost and snowflake shapes, offers other possibilities. Where novelty offers competition to the older standard finishes, there are "tricks of the trade" too numerous to mention.

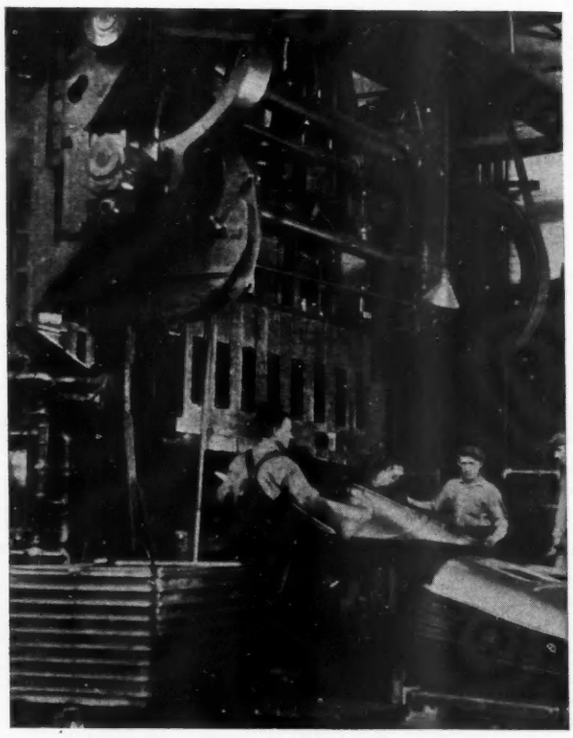
People well versed in color throw up their hands in despair when the color phase of body finishing enters the conversation. One enlightened individual, who has made its phases in application to the automotive industry his career, believes that every individual thinks himself a judge of color, and only the few who are keen students of the subject appreciate its complexities. These few, he hastens to add, do not consider themselves judges—their study has shown them the folly of that. An incident related by another color specialist emphasizes this conception.

In making up the color combinations for the following year's models, the artist had spent a great deal of time trying to work up a few startling schemes to add to the conservative "naturals" to make up the entire line. Naturally, there were a number of combinations which cried to high heaven for immediate death once he saw them as complete jobs. He made his choice of eight or nine new color styles and arranged them for an exhibit before the president of the company, who was to make the final selections. Then he discovered, to his horror, one of these nightmares, with reveals that made the rest of the body groan, had in some way displaced one of the bodies he wanted displayed. It was too late to change—for the president, who had just entered, nominated that one as his choice.

Continual efforts for striking colors and color combinations lead to a knowledge of color possibilities in production that increases the latitude of both the designer and the paint manufacturer. Striking colors do not necessarily mean loud, or even light, colors. Witness the demand for black this year—and the dominating appearance of some of the models finished in solid black, relieved only by the chromium plate of the trim.

The thorough way the paint manufacturers have of combining their artistic endeavor with the color range they can achieve is shown by one manufacturer who states his firm has prepared more than 4000 colors and shades for the various manufacturers. When you consider the dominant conservative tone—the reliance on the darker colors in most models—this is remarkable.

The same company not only submits complete combinations of upper and lower molding and stripe, but has miniature panels of complete doors and rear side details, all completely finished as they would look on the completed car. To give a closer approximation of these miniatures, they are almost large enough to form body parts of the new automobiles of the Austin type. The bottom sections of these panels reveal the make-up of the entire job—the lowest edge is a strip two inches wide, showing the primer; the next strip shows primer after sanding; the next two strips are each a coat of surfacer; then water sanding strip; an in-



At the Budd plant precautions are taken to insure a metal surface which will aid the finisher + + + + + + +

termediate primer strip; the first lacquer strip, and then two double coats of lacquer. That brings the finish coat which continues for the rest of the body up to the molding. Above the molding the regular striping, upper, and reveals coloring are shown.

An automotive manufacturer has these panels on display, in any number and arrangement to suit his needs. Some of the color schemes are the suggestion of the paint manufacturer; others, schemes the automotive designers would like to see worked up. Once they are placed on these panels and exhibited, the manufacturer may be certain that that color can be used in production, and can be matched at will by the paint manufacturer.

Annual Meeting of A. P. I. in Chicago Furnishes Data of Automotive Interest

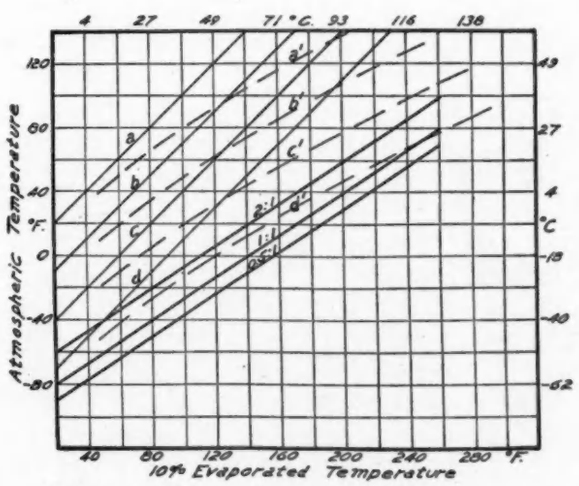
TWO of the technical papers presented at the annual convention of the American Petroleum Institute at Chicago last week were of particular interest to automotive engineers. T. A. Boyd of General Motors Research Corp. described the work which has been done during the past year toward the establishment of standards of anti-knock quality of motor fuels. Of course, the most important accomplishment this year has been the agreement to rate gasolines by octane numbers. When iso-octane is blended with normal heptane, fuels can be produced which knock more violently than the worst gasolines, as well as fuels that have a better detonation characteristic than any commercial fuel. Practically all motor fuels fall between the equivalents of 50 and 70 per cent octane, but a few run below 50 per cent and a few above 70 per cent.

In conjunction with this paper, the Waukesha Motor Co. had one of the committee engines set up in the lecture hall, with all its control instruments, so it could be operated, and it was run for the benefit of those who had not seen the latest equipment.

A paper of particular interest to passenger car designers was read by Dr. Graham Edgar of the Ethyl Gasoline Corp., on the Meaning of the Gasoline Distillation Curve. It contained no new information but was a very clear, simple and lucid summary of the points which have a particular bearing on automobile construction. The starting ability of any gasoline is determined quite definitely by its 10 per cent distillation point. For instance, fuel of which 10 per cent has boiled over with the flask thermometer showing 140 deg. will give easy starting around zero. The exact degree of cold will depend upon the carburetor construction. The richer the mixture that can be supplied to the engine when the choke is closed, the lower the temperature at which easy starting can be obtained.

On the other hand, the 10 per cent point also indicates the temperature at which vapor lock is liable to occur. Thus, with a 10 per cent point of 140 deg., if any part of the fuel line reaches that temperature, vapor lock may be expected. Some part of the fuel system is always considerably above atmospheric temperature after the car is warmed up. In some cases, this is only 20 or 30 deg., but in bad cases, it may be 100 deg. Dr. Edgar displayed a curve showing the relationship of the 10 per cent point to both easy starting and vapor lock tendency. This indicated that with badly designed fuel systems, no gasoline can give easy cold starting and at the same time be free from vapor lock. Easy starting thus depends very greatly upon the design of the fuel system. Cars in which the gasoline pump and fuel lines are kept as cool as possible can safely use very volatile winter gasoline.

A proposal of the U. S. Government Specifications Board was discussed informally. While the 10 per cent point of the distillation curve indicates starting ease and vapor lock tendency, it is possible to have fuels which are worse from the vapor lock viewpoint than the 10 per cent point would indicate, although these same fuels would not be better in starting ability. This situation arises when fuels contain dissolved gases, particularly propane. The presence of such undesirable material is indicated by a direct test for vapor pressure, the 10 per cent distillation point being an indirect test for vapor pressure. It is therefore probable that future specifications will contain a maximum 10 per cent point to indicate starting ability and a maximum vapor pressure (probably at 100 deg. Fahr.) to indicate vapor-lock tendency. This has the advantage that it enables the producer of a highly stabilized gasoline to provide a low 10 per cent point and consequently give very easy starting.



Relation of 10 per cent point of fuel to starting ability at low temperatures for various mixture ratios + + + + + +

Motor Cycles Follow Automobile Trend in Latest Offerings at Paris Show

Twin cylinder engines and unit construction of powerplant and transmission show increase over last year's exhibits

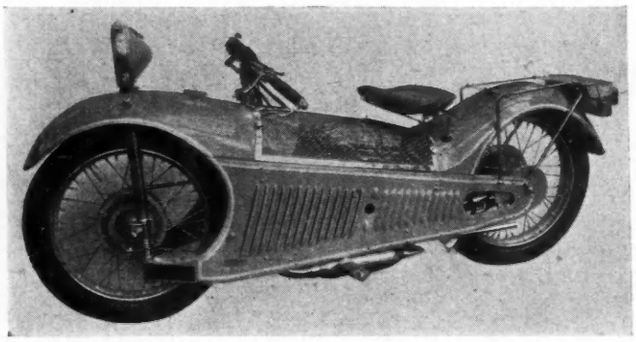
by W. F. Bradley

AUTOMOBILE features of design, comprising pressed steel frames, multi-cylinder engines and shaft drive with either worm or spiral bevel gearing, mark this year's French motor cycle exhibition held in the Grand Palais, Paris.

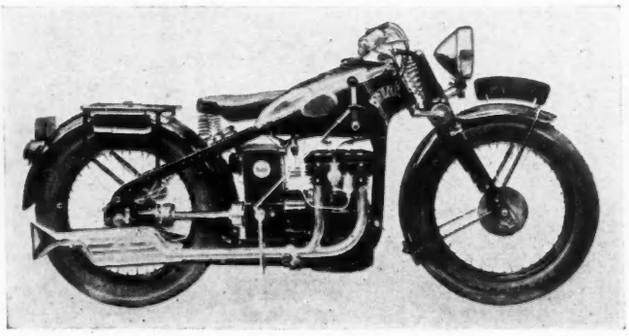
The pressed steel frame is stronger, cheaper to produce, and generally is lower in weight than a corresponding frame built up of steel tubes. The claims for weight saving vary, some makers reducing weight by 8 lb. per machine, while others admit that the two types of construction are equal in weight. In order to lower production costs the same frame is being made use of for two different models, in which case there is a reduction of weight for the bigger model and an increase for the smaller type. Leading firms now using a pressed steel frame are Gnome & Rhone, De Rovin Dresch, Durandal, Majestic, B.M.W. and Mondial.

Four-in-line cylinders are shown by Motocomfort, with a 750 cc. mount having an overhead camshaft driven by a vertical shaft and gearing at the front, also by Train with pushrod-and-rocker operation. A narrow V four with a single detachable head for the set of cylinders is also exhibited by Train.

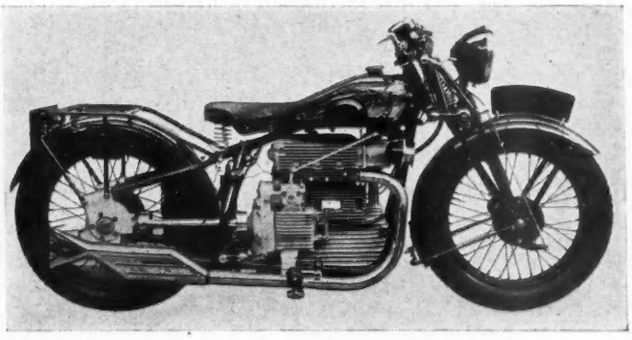
The number of twin-cylinder engines shows a considerable increase over last year. The one most completely



The Majestic has pivot steering, four-cylinder engine, shaft drive and pressed-steel frame



The Dresch has vertical twin-cylinder engine with three-speed transmission, spiral bevel drive and pressed-steel frame + + +

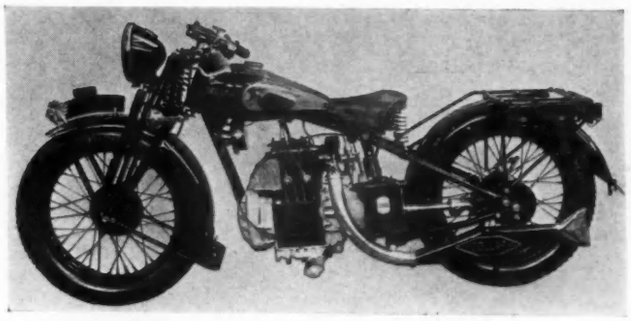


The Motocomfort 750 has a four in line cylinder powerplant with unit transmission and shaft drive + + + + + + + + +

laid out for cheap production is the vertical twin Dresch, which is built entirely on automobile lines. The vertical cylinders are mounted on a cast iron crankcase and the oil is contained in a pressed steel sump. A submerged oil pump delivers lubricant to the two plain crankshaft bearings and to the camshaft. The drive is taken from this latter shaft, thus giving an initial reduction, by means of an open shaft to spiral bevel gearing. Both the frame and the fork are of pressed steel. All the units, with the exception of tires, are used for both the twin 500 cc. model and the single cylinder 250 cc. type.

Gnome & Rhone, one of the leading aircraft engine builders in France, has produced a 500 cc. "flat twin" engine, with unit three-speed transmission, shaft drive and spiral bevel gear, with pressed steel frame and fork. Such automobile features as plain bearings, oil contained in the base chamber, oil pump driven off the camshaft, Solex single control carburetor, are to be found on this model.

Hylett has an L-head V twin set across the frame, with clutch and transmission behind it, and drive by open shaft and worm gearing to the rear wheel. In this, as in all other cases of shaft drive, the worm or bevel, as well as the brake drum, remain in position when the wheel is removed by withdrawing a spindle. The Majestic has a four-cylinder engine in a pressed steel frame without the usual steering forks. The lower and the upper front ends of the frame are united by a vertical tube, on which the wheel is mounted as in automobile practice. Levers and a tie rod connect up to the handle bars. The mudguards form part of the frame, both front and rear.



The Dollar 500 is driven by a four-cylinder narrow angle V engine and shaft drive + +

Alcyon, who produced a single-cylinder, three-speed-transmission, worm-driven model with a tubular frame one year ago, is continuing this and is marketing it, under various names, through associate firms.

Unit powerplant construction shows an increase over a year ago. Makers are carrying out an extensive publicity campaign in favor of these new designs, making use of the argument that tubular frames and chain drive went out of use on automobiles more than 20 years ago, and should not be accepted on motor cycles.

Centerless Grinder With Production of 90 Finish-ground Pieces per Hour

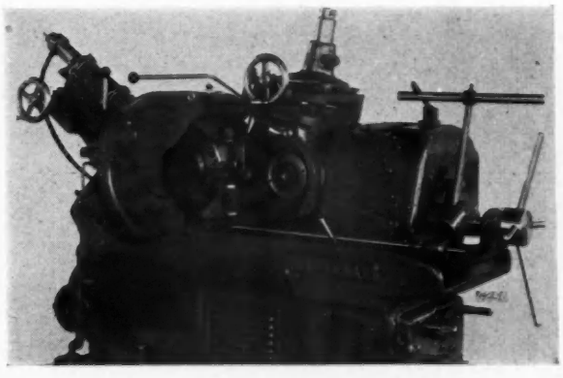
TWO diameters of dynamically and statically unbalanced steering knuckle shafts are simultaneously and quickly ground by this interesting application on a Cincinnati No. 2 Centerless Grinder. A double-grinding wheel mount is used with the wheels, profiled to grind both diameters in one cut by the infeed method.

The steering knuckles of drop forged steel are placed on the special stepped, work-support blade and are held firmly in position by an overhead equalizing pressure shoe. To overcome the unbalanced condition, due to the heavy arm, a counterweight is used during the grinding operation.

The operating mechanism for performing this job is located on the rear portion of the work rest and is so designed that the overshoe is automatically lowered and raised on each stroke of the infeed lever, thereby clamping and freeing the piece.

A spindle reciprocating attachment with a hand lever extending to the operator's side of the machine is supplied for advancing the grinding wheel forward a slight amount to clean up the shoulder and fillet of the portion adjacent to the ground cylindrical diameter at the end of the cut.

Stock removal is 0.010 in. on both diameters. Two in. x 1½ in. x 12 in., 60-M-82, Aloxite grinding wheels are used. Production of 90 finish-ground pieces an hour is obtained and limits for size are held within 0.0005 in., for roundness within 0.0003 in. and for straightness within 0.0003 in.

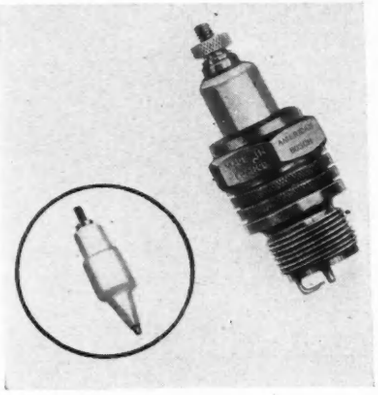


By the infeed method it grinds both diameters in one cut + + + +

NEW DEVELOPMENTS—AUTOMOTIVE

American Bosch Spark Plug With Masilite Insulator

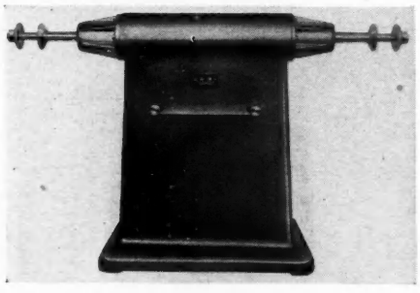
A NEW spark plug placed on the market by the American Bosch Magneto Corp. is insulated with Masilite. These insulators are imported from France and are said to be so hard and so highly glazed that it is not injured by temperatures up to 1600 deg. Fahr. The method of fitting the insulator in the plug is said to be such as to obviate gas leakage and loss of compression. Electrodes are of heat-resisting alloy, the side electrode being of crescent shape, which tends to maintain the length of the gap for a longer period. The new American Bosch spark plug is available in all standard types and sizes.



Independent Spindle Buffers

A VARIABLE Spindle Speed Buffer, with the advantage of a different speed on each of the two spindles, is announced by the Black & Decker Mfg. Co., Towson, Md.

Spindle speeds from 2000 to 3000 r.p.m. are possible, and these selective speeds are obtainable by quick-change pulleys applied to the shaft of the motor located in the base. The buffing heads are each driven with two cog belts and either hand may be stopped by means of a clutch, one for each spindle. The spindles have automatic brakes and when the clutch is disengaged, the buffing head stops immediately.



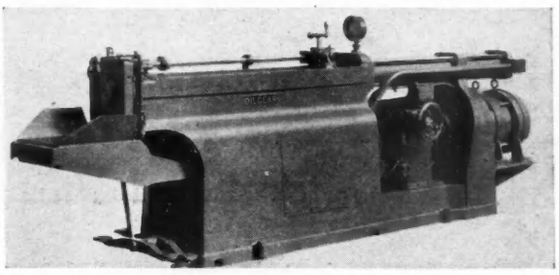
Spindle locks are unnecessary for ordinary applications, but are obtainable at a slight additional cost at the user's option.

The motor is extra heavy-duty ball-bearing type, capable of large overload. It is mounted on a removable steel plate in the rear of the buffer and is suspended in such fashion that by means of a small hand wheel, proper tension on the "V" belts is maintained by lowering or raising the motor.

Oilgear Horizontal Broaching Machine

HIGH-SPEED broaching of small and medium-sized parts with closer limits for finished dimensions, and a peak pulling capacity of 15,000 lb. feature the Model XL-12 horizontal broaching machine recently announced by The Oilgear Company, Milwaukee, Wis.

The power unit consists of an Oilgear type "WSG-6" variable delivery pump mounted in the frame as an integral part of the machine. The pump is operated at a maximum speed of 860 r.p.m. It is said to deliver a smooth and pulsationless flow of oil under pressure in direct proportion to the pull required for broaching and the oil displacement is practically positive against any resistance up to the maximum capacity. A hand wheel mounted on the pump controls the amount of oil delivered and the speed of the draw head.



The control mechanism consists of a simple hand lever and double foot pedal. By using the foot pedals to start and reverse the draw head, both hands are free to serve the machine. Two adjustable cams, mounted on the control rod, automatically stop the draw head at the end of the desired stroke. The stroke can easily be changed to suit the work and tools. When the automatic stops are set, the length of stroke remains fixed without over-running. The control mechanism operates a special combination control valve which reverses the flow of oil from the pump to the cylinder. The automatic unloading valve which opens and stops the draw head motion the instant the machine reaches the maximum capacity is an integral part of the control valve.

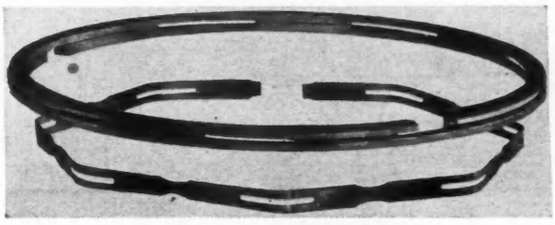
This machine is equipped with a 10 hp. 860 r.p.m. constant speed motor as shown on a flanged type. Pulling speed is variable from 4 to 33 r.p.m. Floor space 25 in. x 147 in. Net weight 3600 lb. approximately.

PARTS, ACCESSORIES AND PRODUCTION TOOLS

Pedrick Oil-Control Ring

A RECENT addition to the line of the Wilkening Manufacturing Company, Philadelphia, Pa., the Pedrick heat-shaped sectional oil-control ring, consists of two cast iron sections whose combined width is equal to that of the ring groove reduced by the proper clearances, and of a steel inner ring. Each of the cast iron rings is ground flat and parallel on the sides by a special lapping process. The lower side of the top section and the upper side of the bottom section are milled to produce, when installed, a groove in the middle of the face of the ring, from which ports or slots lead through to the back of the ring. The upper edge of the top ring is beveled or chamfered. Each section has a rolled-turned finish on its face and is tensioned by heat treatment.

The inner ring is made of Swedish charcoal steel and is relieved where it comes in contact with the back of the piston groove. The humps of the inner ring which bear against the inside of the outer rings are slotted. The manufacturers recommend that one of these oil-control rings be installed on a piston with three ring

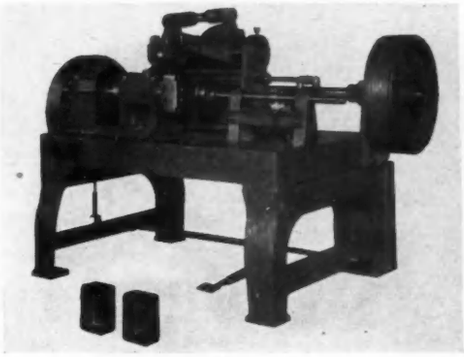


grooves, and two on a piston with four grooves. On the up-stroke of the piston the bevel on the upper edge of the top section allows surplus oil to slide over it and to be scraped into the groove by the independent bottom section. On the down-stroke such oil as escapes the bottom section is caught by the independent top section. This oil packs the sections tightly in the grooves, the surplus draining away through the slots in the inner ring and the holes in the back of the piston groove.

New Bliss Trimmer

THE E. W. Bliss Company, Brooklyn, New York, recently designed and built a new type of trimmer for trimming symmetrical boxes or containers made from brass or mild steel. The thickness of stock which can be trimmed is 3/32 in. and the machine will handle shells measuring 20 in. across corners and up to 6 in. in depth. The minimum size of shells handled is 4½ in. in width and 1 in. deep. The ratio between width and length of shell cannot exceed 2:1.

The machine is arranged with a Bliss positive rolling key clutch and the gearing is such that



the shaft actuating the trimming cam rotates once while the chuck spindle rotates one and one-half times. For this reason it is necessary that the shells or boxes to be trimmed be symmetrical, as the starting point is the same every other time the shell is being trimmed. The upper cutter is mounted on a rocker arm and runs in roller bearings. The rocker arm is operated by a follow cam which conforms to the contour of the article to be trimmed, a separate cam being required for each varying shape. End thrust bearings on rocker arm shaft maintain clearance between upper and lower cutters.

Operated by a 7½ hp. variable speed motor running at 900 to 1800 r.p.m., the machine turns over at 20 to 40 r.p.m. and trims 5 to 10 shells per minute; of course this varies with the size of the shell and expertness of the operator.

Ohmer Offers New Taxi Register

OHMER FARE REGISTER COMPANY, Dayton, Ohio, has added to its line of taximeters a new Model 99 which is simpler and lighter than its previous types and so designed that it can be mounted on the dash of any automobile. It is not a printing meter like the original Ohmer taximeter, but it is believed to meet all requirements of the owners of small fleets and of individual owners.

On the face of the meter, in large white figures, is indicated the fare to be paid. The extra fare for additional passengers or extras is also clearly indicated. On the back of the meter are fine sets of visible totalizers which give the cab owner the following information about the operation of his cab: Total paid miles, total dead miles, number of trips, number of passengers carried, number of extras, total amount of money collected for the day, and income per cab mile.

Automotive Oddities—By Pete Keenan

A GALLON OF GAS.

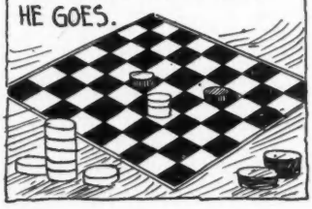
SOLIDIFIED GASOLINE WAS MANUFACTURED AS A "SAFE" FUEL IN ENGLAND IN 1911. IT WAS CARRIED IN CAKES ON THE RUNNING BOARD, AND LIQUEFIED FOR USE IN A MUFFLER-HEATED DEVICE. (Thanks to R.W.A. Brewer)

THE PENNINGTON FAN-MOTOR BICYCLE 1895.

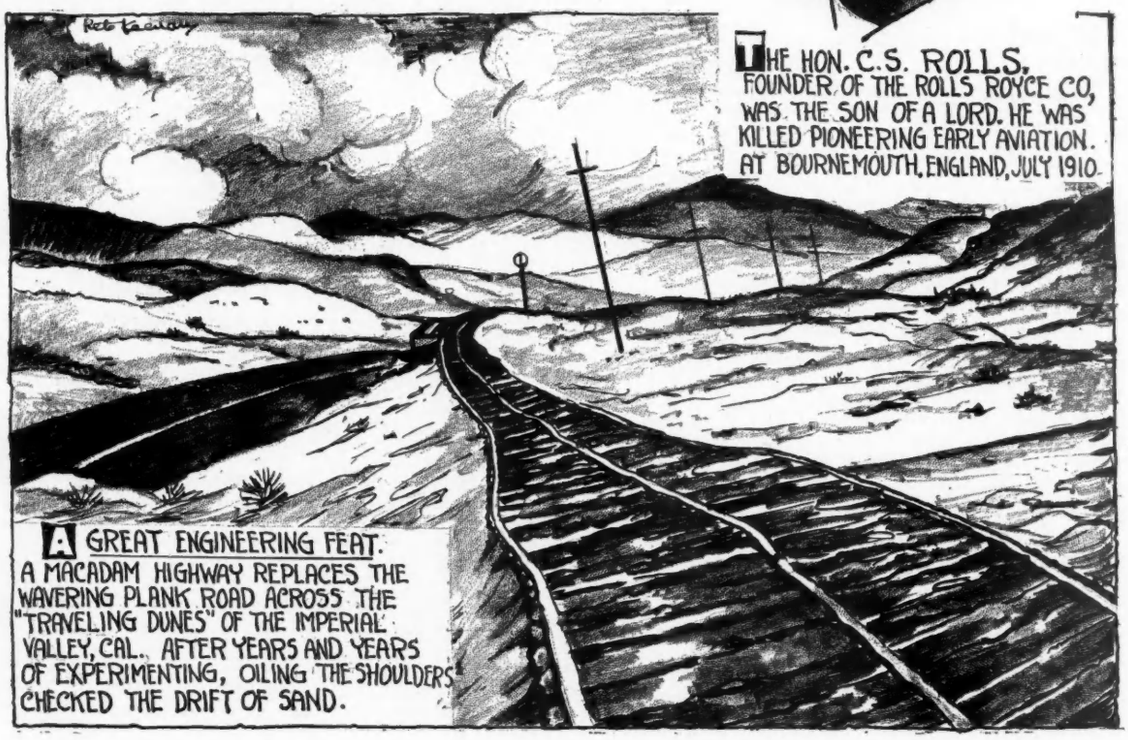
THE GOLD CUP

FAMOUS MOTOR BOAT TROPHY IS ACTUALLY STERLING SILVER- *(IT IS GOLD PLATED)*

WM. C. DURANT, THE AUTOMOBILE MANUFACTURER, ALWAYS CARRIES A SET OF CHECKERS WHEREVER HE GOES.



THE HON. C.S. ROLLS, FOUNDER OF THE ROLLS ROYCE CO, WAS THE SON OF A LORD. HE WAS KILLED PIONEERING EARLY AVIATION. AT BOURNEMOUTH, ENGLAND, JULY 1910.



A GREAT ENGINEERING FEAT.

A MACADAM HIGHWAY REPLACES THE WAVERING PLANK ROAD ACROSS THE "TRAVELING DUNES" OF THE IMPERIAL VALLEY, CAL.. AFTER YEARS AND YEARS OF EXPERIMENTING, OILING THE SHOULDERS CHECKED THE DRIFT OF SAND.

NEWS OF THE INDUSTRY

1930 Profits Within 60% of Peak Years

Optimism the Keynote at Joint Exposition of N.S.P.A. and M.E.A. at Cleveland

CLEVELAND, Nov. 19—A distinctly optimistic outlook for 1931, supported by better than expected business in 1930, was revealed when several hundred manufacturers and wholesalers of automotive equipment, parts and supplies gathered in Cleveland for the joint automotive exposition of the National Standard Parts Association and the Motor & Equipment Association and the individual conventions of those groups. Manufacturers and wholesalers generally reported definite improvement in business beginning Sept. 15. Wholesalers will show net profits for 1930 averaging within 60 per cent of those of the peak years of 1928 and 1929.

Further evidence of confidence in the future was the decision of the Motor & Equipment Association to appropriate $50,000 for the continuance of the "Care Will Save Your Car" campaign in 1931.

The joint show, bringing together for the first time the memberships of both associations, and providing the largest automotive equipment exposition in the industry, was approved and boards of directors of the associations were requested to hold a joint show again in 1931.

The selection of the city was left to the boards of directors. Atlantic

(Continued on page 772)

Curtiss Reports Loss

NEW YORK, Nov. 18—The Curtiss-Wright Corp. and subsidiaries report for the quarter ended Sept. 30 net loss of $1,807,594 after deduction of $1,097,091 for depreciation, inventory markdowns and other extraordinary charges. Net loss for the first nine months this year totaled $7,159,255. The company was formed in August of last year.

Packard Advances Gilroy

DETROIT, Nov. 19—J. A. Gilroy, formerly in charge of sales educational work for the Packard Motor Car Co., has been made supervisor of sales on the de luxe Packard eight.

The News Trailer

By Herbert Hosking

Liberia will have an American bank under **Firestone** auspices . . . every Friday is a Black Friday in Liberia * * * **Vincent Bendix** is importing a Chinese temple which **Dr. Sven Hedin**, Swedish explorer, will bring back and erect for him in Chicago * * * Duesenberg sold $187,000 worth at the Chicago Salon, a new record * * * the wildcat bus racket is **Chicago's** latest contribution to the high cost of legitimate business * * * "Judge" reports the traffic cop who said: Hey, **Mister**, you can't park there," to be answered, "Officer, you may know the traffic rules, but you don't know this car" * * * 16,280 miles separate **Wallace Campbell**, pres. **Ford Motors Canada**, and **Hubert C. French** of the Ford Australian plant at **Geelong**, but they often meet, by telephone * * * October registrations in Wayne County show **Nash** in seventh place—September showed thirteenth * * * **British** transport planes will have smoking rooms * * * **Boeing** of Canada is working on a new flying boat * * * the sixteenth anniversary of the **Dodge** car occurred Nov. 14 . . . No. 1 has run 350,000 miles and is still going in **Nashville** * * * **C. O. Miniger** is now rear commodore of the Interlake Yachting Association . . . he flies the **burgee** of the Toledo club * * * **Wilmington, Del.**, service men are fighting competition from inmates of the New Castle, Del., workhouse, who are permitted to repair cars * * * **Kenosha** has just opened its new YMCA building . . . half the cost was contributed by C. W. Nash * * * Alabama dealers must check on the **moral** standing of a car buyer if they expect to recover when a car has been seized by the Internal Revenue Department * * * **B. A. Gramm**, pres. Gramm Motors, radioed Nov. 12 on "The Trend of the Times."

Roe to Discuss Jigs

PHILADELPHIA, Nov. 19—Joseph W. Roe, professor of industrial engineering, New York University, will discuss "Jigs and Fixtures," at the November meeting, Philadelphia Section, American Society of Mechanical Engineers on Tuesday, Nov. 25.

Sees 1931 Increase In Car Financing

Milan V. Ayres, N.A.F.C. Analyst, Predicts 12 Per Cent Sales Gain

DETROIT, Nov. 19—A 10 per cent gain in the volume of new car financing and a 15 per cent increase in used car financing were forecast for 1931 by Milan V. Ayres of the National Association of Finance Companies at the association's annual meeting held in Chicago on Tuesday and Wednesday of this week. Mr. Ayres' forecasts were based on an expectation that new car sales would show an increase of 12 per cent next year over this year.

The elimination of the use of lax credit as a competitive weapon and the rehabilitation of the automobile dealer appear to be the major concerns of the finance companies. In an effort to maintain volume, credits were not scrutinized as carefully as they should have been earlier this year and a sharp increase in repossession losses has been the result.

Recently, however, there has been a general tightening up in this respect. Easy money this year has operated to reduce the business costs of companies large enough to borrow on collateral trust notes. The smaller companies, however, which have had to depend on their local banks for their borrowing have not shared proportionately in the benefits of cheap money.

Paul G. Hoffman, Studebaker vice-president, bespoke the cooperation of the finance companies in putting over the programs which the car makers are putting on to promote the operating efficiency of dealers.

Accident Deaths Increase

WASHINGTON, Nov. 19—During the four weeks ended Nov. 1, deaths from automobile accidents in 78 large cities reporting were 750, according to the Department of Commerce, Division of Vital Statistics. This figure compares with deaths totaling 842 in the four weeks ending Nov. 2, 1929, and has not been equaled since the four-week period ending Nov. 30, 1929, when 839 deaths were reported.

Men of the Industry and What They Are Doing

Maurice Olley Joins Cadillac

Maurice Olley, British engineer and for eleven years chief engineer of the chassis division of the Rolls-Royce Co. of America, has joined the engineering staff of the Cadillac Motor Car Co., according to an announcement by E. W. Seaholm, chief engineer. Mr. Olley was trained in England, and was for many years drafting designer for Sir Henry Royce. At the outbreak of the war, he played an important part in designing the first Rolls-Royce Eagle, a V-12 water-cooled aircraft engine which, with refinements, is still used extensively by the British air forces. He also designed the first integral reduction gear for use with this engine.

In July, 1917, he came to the United States where, for a time, he was in charge of the manufacture on subcontracts of the Rolls-Royce 360 hp. Eagle aircraft engines which were extensively used on Allied aircraft. After the Armistice, he was one of a group which was instrumental in forming the Rolls-Royce Co. of America in October, 1919. Mr. Olley was made chief engineer of the new company, a position which he held until he joined the Cadillac forces.

Olds Names Sepanek

Oscar A. Sepanek has been appointed chief inspector at Olds Motor Works to succeed George T. Christopher, who has been transferred to the Oakland Motor Car Co. Previous to his promotion Mr. Sepanek was in charge of Oldsmobile final inspection.

Oakland Names E. H. Smith

Edson H. Smith, formerly in charge of sales in Kansas City and most recently in New York, has been appointed Indianapolis zone manager for the Oakland Motor Car Co.

Young Elects Clark

Harold Benjamin Clark of the New York brokerage firm of White, Weld & Co., has been elected a director of the L. A. Young Spring & Wire Corp., succeeding J. Mitchell Hoyt, resigned.

Olds Appoints Zimmerman

C. M. Zimmerman, formerly assistant zone manager of Oldsmobile-Viking branch at Washington, D. C., for the past year, has been appointed zone manager in that city.

Gerlach Forms Own Agency

A. J. Gerlach, formerly advertising manager of the Sterling Motor Truck Co., Milwaukee, and more recently serving the T. L. Smith Co., concrete mixers, Milwaukee, in a similar capacity, has resigned to establish an advertising agency of his own, specializing in industrial advertising. He is now president of the Milwaukee Association of Industrial Advertisers.

Woolson Meets Canadian Section; Presents Paper

DETROIT, Nov. 17—Harry T. Woolson, chief engineer, Chrysler Corp., addressed the regular monthly dinner meeting of the Canadian section of the S.A.E., at Toronto, Wednesday, Nov. 19, on "Automotive Engineering Organization and Methods."

Fenner Addresses C. of C.

NEW YORK, Nov. 19—David C. Fenner of Mack Trucks, Inc., and representative of the National Automobile Chamber of Commerce, spoke today before the Association of Western Massachusetts Chambers of Commerce in Springfield, Mass.

Joint Exposition at Cleveland

(Continued from page 771)

City, Chicago and Cleveland were mentioned as possible show cities for 1931.

The elections: Motor & Equipment Association—President, E. T. Satchell, Motor Accessories Co., Allentown, Pa.; vice-president, division A, C. H. L. Flinterman, Wilcox-Rich Corp., Detroit; vice-president, division B, C. C. Secrist, Victor Gasket & Mfg. Co., Chicago; vice-president, division C, C. F. Wright, Ballou & Wright, Portland; treasurer, C. H. Burr, SKF Industries, New York. Directors: F. W. Wacker, Automotive Maintenance Machinery Co., Chicago; David Beecroft, Bendix Corp., New York; C. P. Brewster, K-D Mfg. Co., Lancaster, Pa.; Lothair Teetor, Perfect Circle Co., Hagerstown, Ind.; W. R. Crowe, Crowe-Burlingame Co., jobber, Little Rock, Ark.; F. L. Floyd, Ward-Dossett-Floyd Co., jobber, Waco, Tex., and A. V. Hall, Sherwood-Hall Co., jobber, Grand Rapids, Mich.

National Standard Parts Association — President, C. M. Burgess, Burgess-Norton Mfg. Co., Geneva, Ill.; vice-president, Verne Olsen, Automotive Service Co., Minneapolis. Manufacturer directors: H. J. Lange, Marquette Mfg. Co., St. Paul; R. B. Davis, Raybestos-Manhattan Co., Bridgeport; T. L. Ford, American Hammered Piston Ring Co., Baltimore. Jobber Directors: L. N. Diedrich, L. N. Diedrich Automotive Parts, Ventura, Calif.; I. Gordon, Gordon Motor Parts, Inc., Rochester; T. C. Olson, T. C. Olson Co., Madison, Wis., and J. C. Rogers, Automobile Piston Co., Atlanta.

Car Industry Will Be First to Recover—Miller

Willys-Overland President Sees Early Advancement

BUFFALO, Nov. 17—The automobile industry will be the first to recover from the present depression, general throughout the country, in the opinion of Linwood A. Miller, president of the Willys-Overland company of Toledo, who addressed a gathering of more than 200 Willys dealers from New York State in Hotel Statler last week.

"Soon after the upward trend of business starts, it may be confidently expected that public confidence will be restored, largely through less unemployment. With the return of confidence and optimism, rapid strides will be made toward complete economic recovery," he declared.

The meeting was devoted to a discussion of plans and policies for 1931. Mr. Miller anticipates greater dealer success in 1931 and by economies and improved practices in factory operation expects a program that will excel any during the past decade.

Anticipating a restoration of normal business during the early part of next year, practically all automobile manufacturers gradually are increasing their working forces, the speaker stated. Stocks of new and used cars have been so greatly reduced that there is now no inventory handicap.

Other members of the Willys-Overland executive staff present were: George M. Graham, vice-president and former vice-president of the Pierce-Arrow Motor Co. in Buffalo; Nelson A. Beardsley, general sales manager, Thomas A. Russell, president of Willys-Overland, Ltd., Toronto; George Maddison, district sales manager, and Ward M. Canaday, president of the United States Advertising Corp.

Du Pont Declares $1.00

NEW YORK, Nov. 18—E. I. du Pont de Nemours & Co., Inc., has declared regular quarterly dividend of $1 on common, payable Dec. 15 to holders of record Nov. 26, and $1.50 on debenture stock, payable Jan. 24 to holders of record Jan. 10.

Wilson Foundry Adds Men

PONTIAC, Nov. 19—Wilson Foundry & Machine Co. will have 1800 men on payroll by end of week and plans to add to this number during next few weeks. Only former employees are being hired.

Thermoid Has New Device

TRENTON, N. J., Nov. 19—Thermoid Rubber Co. has acquired the patent rights on a rubber plug that permits testing of a radiator core for leaks, and is now marketing the device.

Moon Motor Car Co. Gets Temporary Receiver

Application for Liquidation Refused in Federal Court

ST. LOUIS, Nov. 20—The Moon Motor Car Co., makers of Windsor and Ruxton automobiles, was placed in temporary receivership Nov. 15 on application of a minority stockholder who alleged that the company had ceased operation and was being liquidated for the benefit of creditors.

Application for the appointment of a Federal receiver to liquidate the company was refused without prejudice Nov. 18 by Federal Judge C. B. Faris.

Seneca C. Taylor, an attorney, was appointed temporary receiver by Circuit Judge Hogan. The suit was filed by Elmer Nashlund of St. Louis, who alleged that since Oct. 31 affairs of the company have been in charge of an officer of one of the largest creditors of the Moon Company. The petition related that the company is solvent with total assets of $1,123,000 against general liabilities and accounts payable of $205,000 and liabilities on commitments (materials ordered) of $492,000.

The Moon Co. grew out of the Moon Bros. Carriage Co., which made carriages for years before the first motor car was built. Joseph W. Moon, the founder, died in 1919, and was succeeded as president by Stewart McDonald, and later by Carl W. Burst. The company was sold last April to eastern capitalists headed by William J. Muller. In September the new owners sued the former officers for $536,470, alleging that they had diverted funds and had misrepresented the value of the plant.

Shares of the Moon Company, which climbed from $3.75 to $16.50 last spring, last week were sold at $1. About 350,000 of 500,000 no-par shares are outstanding.

Bosch Merger Plans Set

NEW YORK, Nov. 18—Robert Bosch Magneto Co., Inc., and American Bosch Magneto Corp. have drawn up an agreement for the merger which calls for the issuance of 69,600 shares of stock and warrants representing the right to subscribe on or before Dec. 31, 1933, for all or any part of 50,000 shares of stock. These 50,000 shares are to be sold on the basis of 16,666 shares at $30 a share, 16,667 shares at $35 a share and 16,667 shares at $40 a share.

It is also proposed to grant to new employees joining the corporation as the result of the merger options to purchase 12,000 shares on or before Dec. 31, 1933, on the following basis: Up to 35 per cent at $37.50 a share at any time after Jan. 1, 1931, up to 35 per cent at $38.50 any time after Jan. 1, 1932, and up to 30 per cent at $39.50 at any time after Jan. 1, 1933.

Ford Spending $60,000,000

DETROIT, Nov. 19—Ford Motor Co. announces $60,000,000 building and expansion program covering building of five new plants in United States, improvement work at Rouge plant, work on new Dagenham plant in England and projected erection of plants at Cologne, Antwerp, Rotterdam and Stockholm.

Shop Methods Session Planned

NEW YORK, Nov. 19 — The first meeting of the shop methods division of the American Management Association will be held Dec. 11-12 at the William Penn Hotel, Pittsburgh. Session leader will be P. L. Dildine, manager, factory standards department, B. F. Goodrich Co., Akron, who will present a paper on "The Viewpoint of Shop Methods Men" at the dinner session on Dec. 11. Other papers will be presented by W. T. Foultz, time study and methods engineer, White Co., and A. L. Kress, manager, industrial engineering department, U. S. Rubber Co.

German Tire Exports Gain

WASHINGTON, Nov. 19—During the first 9 months of 1930 Germany exported 240,759 automobile casings as compared to 203,400 in the first 9 months of 1929, according to the rubber division, Bureau of Foreign and Domestic Commerce. Inner tubes exported from Germany during the first 9 months of 1930 amounted to 198,677 as compared to 180,634 in the same period of 1929. Germany exported 5229 solid tires during the first 9 months of 1930 as compared to 10,099 in the first nine months of 1929.

Propose Rubber Restriction

NEW YORK, Nov. 18—A proposal has been made by the British rubber producers that they, together with the Dutch producers, set aside a portion of next year's crude rubber production to be devoted to new uses, with the object of stimulating consumption, according to advices received here this week by the Rubber Exchange of New York. It is understood that the Dutch producers have received the proposal favorably but are taking a week to consider before granting definite approval.

Faith Succeeds Kingsley

CHICAGO, Nov. 17—Faith Mfg. Co., 5920 N. Crawford Ave., has succeeded the Kingsley-Miller Co., manufacturer of radiator caps, etc., according to an announcement from the former company.

Meteor Co. Declares

NEW YORK, Nov. 19—Meteor Motor Car Co. has declared regular quarterly dividend of 25 cents, payable Dec. 1 to holders of record Nov. 20.

Market Unsteady on Copper's Gyrations

Higher Quotations Follow Output Restriction Plans

NEW YORK, Nov. 20—The copper market this week is in a muddled state, with reports of production curtailment sending bids above the low points current during the past several months. Although the firmer tone in copper prices has been heralded as the awaited salvation of the commodity price situation, and has had some effect on the stock market, some producers are still offering metal below the top quotations and no definite predictions on the trend of the market will hold water for more than a few hours at a time.

Efforts on the part of flat steel producers to put first quarter 1931 prices on a somewhat higher level took the form this week of notice to buyers that prevailing prices would not apply to hangover tonnages remaining unspecified at the end of next month.

Buyers anxious to take advantage of current low prices, it was said in so many words, would have to place orders accompanied by specifications right now and take the steel before the end of the year. Upward revision of finished steel prices for first quarter 1931 would have to be expected.

Usually when such intimations are given to consumers in advance, the intent is to "smoke out" as much business as possible at old prices. While producers would unquestionably welcome at this time additions to their December rolling and finishing schedules, prevailing conditions are such that they are hardly figuring on an avalanche of December specifications, so that the thought uppermost in their mind in these notices is to pave the way for a new 1931 price deal.

It is the consensus of opinion in the steel market that upward revision will be along very moderate lines. While it is conceded that some descriptions of finished steel products are selling at prices that spell a loss to most of the producers, sellers are well aware of the difficulties which even a moderate upward readjustment of prices will have to face. Meanwhile, however, there is no question that because of the program which producers have mapped out for themselves the market's undertone is firmer.

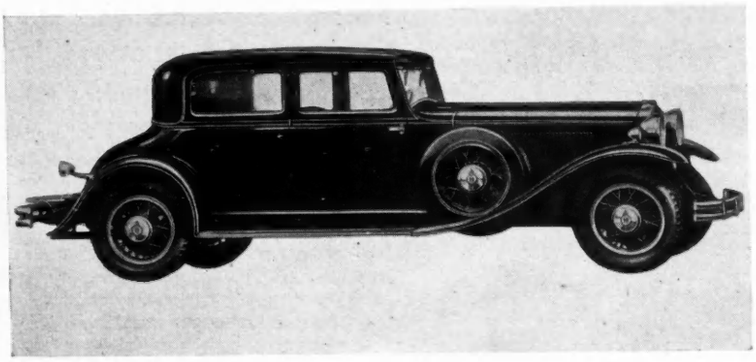
Aluminum—The market for remelted metal is a shade firmer, No. 12 alloy being quoted fractionally higher. Virgin metal prices are unaltered.

Tin—As the result of the unsettlement in the copper market, Straits tin was offered at 26.10 cents at the beginning of the week, compared with 26.75 cents, last week's closing price.

Kinner Reports Loss

NEW YORK, Nov. 18—Kinner Airplane & Motor Corp. reports net loss for the nine months ended Sept. 30 of $101,313 after all charges. This compares with a loss of $2,244 for the corresponding period last year.

Some Interesting



The vogue of the victoria is heralded by the five-passenger coupe (upper left) recently introduced by Hupp. It is mounted on the 133 hp. Series U chassis and lists at $2,495 + + + + + + + +

Max F. Wollering has been appointed manufacturing director of the Hudson Motor Car Co. He was formerly vice-president in charge of manufacturing of the Studebaker Corp. + + + + +

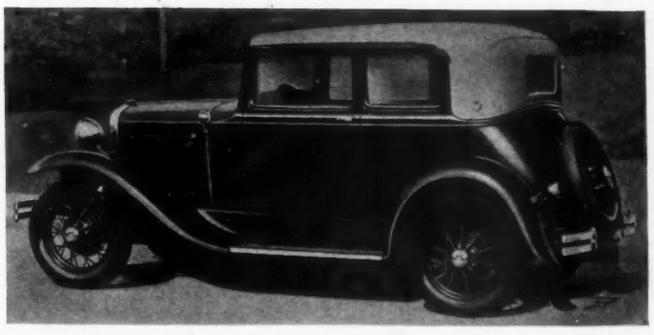
The Curtiss mail plane pictured was specially designed for Pan American-Grace Airways to combat difficult flying conditions encountered in traveling fast schedules over the Latin Americas + + + + +

Sir Percival and Lady Perry gaily face the ship's photographers before disembarking from the Bremen at New York to make a tour of the Ford plants at Dearborn and elsewhere in the U. S. Sir Percival is managing director of Ford Motor Co., Ltd., England + + +

Events and Persons in News of the Automotive World

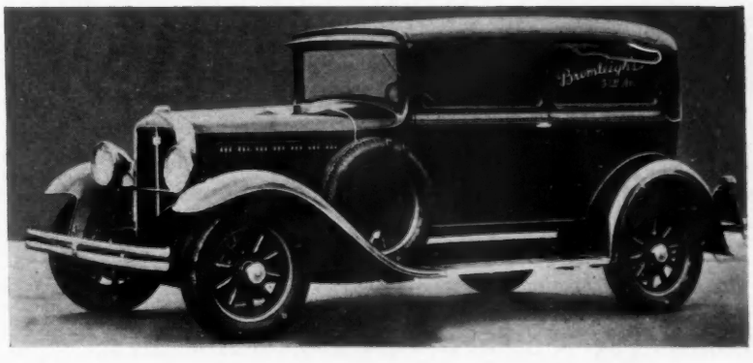
Mr. and Mrs. Henry Ford (upper right) refused to be interviewed on their recent return from an inspection tour of the Ford European interests, but it needs no caption to tell that Mr. Ford was satisfied with what he saw + + + + + + +

The new Ford four-passenger victoria is the latest addition to the de luxe line of cars recently introduced by the Ford Motor Co. It is being currently exhibited in metropolitan centers + + + + + +

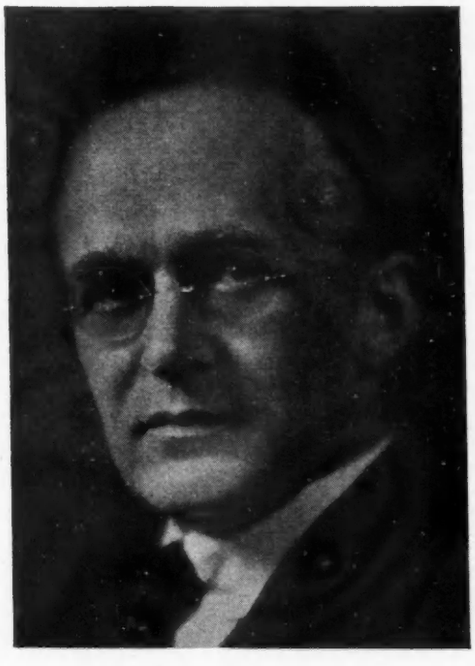


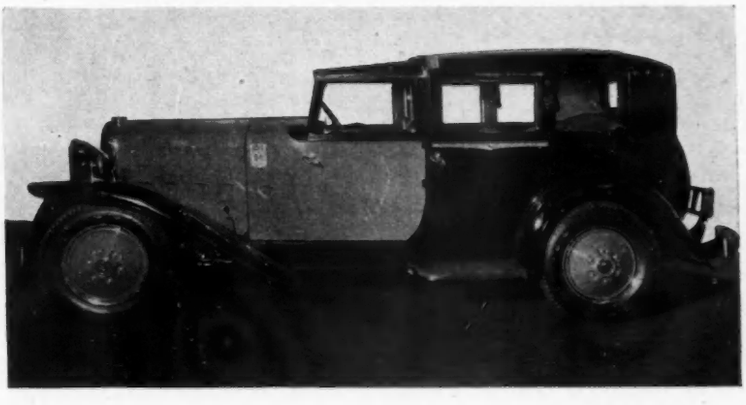
The S.P.A. Truck Corp. has introduced this 1½-ton de luxe delivery car on a six-cylinder Studebaker chassis. The new model is designed to fill out the series of S.P.A. trucks previously announced + + + + +

The Checker Cab Manufacturing Co. designed this new model (lower right) for service with a subsidiary operating company in New York. The same cab in a different color scheme will be available for independent operators + + + +



Maurice Olley (below), after a long association with Rolls-Royce, has joined the engineering department of the Cadillac Motor Car Co. + + + + + +





I. C. C. Examiners Begin Series of Hearings On Coordination of Motor Transportation

ST. LOUIS, Nov. 18 — "Motorbus and truck transportation constitutes a permanent part of our national transportation system and has furnished such competition to the railroads as to greatly reduce their tonnage and revenues," declared commissioner Ezra J. Brainerd at the opening of the four-day hearing on "Coordination of Motor Transportation" here by the Interstate Commerce Commission.

The investigation is designed to result in recommendations for Federal supervision over bus and truck lines, and their coordination with rail facilities. The trend of testimony at the hearings indicates that such regulation is necessary to avert "cut-throat" tactics in the competition between railroads operating bus lines.

"The passenger business of major railroads in the western district has declined about $240,000,000 since 1920," Commissioner Brainerd said. "Railroads have attempted to meet this competition by establishing motor vehicle lines of their own, some directly and others indirectly through the organization of subsidiary companies."

The railroad-controlled bus lines, it was brought out, are apt to violate in competition the spirit of Interstate Commerce Commission regulations through slashing prices and invading foreign territory. It is to correct these and other ills that 17 hearings at transportation centers throughout the country have been set.

P. J. Neff, general manager of the Missouri Pacific Transportation Co., a bus line subsidiary of the Missouri Pacific Railroad, was typical of the witnesses examined.

Mr. Neff told of the substantial ownership by railways of bus and truck companies. Unless a regulatory body is established, railroads might use bus and truck subsidiaries to compete with other rail lines, which the railroads proper could not do under Interstate Commerce Commission regulations, Mr. Neff said. Some railroads have already adopted the practice, according to the testimony.

Legislation is needed also, Mr. Neff brought out, to increase the highway safety factor, to require regular inspection of equipment, and to prevent duplication of service. He said the Missouri Pacific Transportation Co. afforded coordinated service along the Missouri Pacific lines, serving as feeders, and replacing certain branch line trains. Operation of the bus company is profitable only indirectly, requiring consideration of the effect on the coordinated system. Missouri Pacific rail passenger revenue has suffered a loss of $10,000,000 since 1920, due principally to private automobiles, Mr. Neff testified.

"The modern railway must offer a coordinated rail, bus, and truck service," F. H. Millard, assistant to the president of the St. Louis Southwestern lines, said, after telling how his line stopped a passenger revenue leak so great that revenues threatened to reach the vanishing point in 1933, by establishing a bus line subsidiary. Mr. Millard said the bus line stopped the decline in the cotton belt's passenger business, and checked a falling off in the merchandise business, which dropped 46 per cent since 1923. He emphasized the point that rail, bus, and truck service must be considered as one system.

Representatives of virtually every railroad in the country, numerous motorbus companies, and various automotive organizations attended the hearing, which is conducted by Commissioner Brainerd, assisted by attorneys Leo J. Flynn and E. A. Stephan, examiners for the I.C.C.

The series of hearings are strictly "fact finding," and will be concluded next March at Washington. Facts sought include the economic problems involved, obstacles in the way of coordination, results of experiments in coordination, and constructive suggestions based on experience.

Places and dates of future hearings are as follows:

Kansas City Mo., Chamber of Commerce Rooms, Nov. 21; Dallas Tex., Baker Hotel, Nov. 28; New Orleans, La., Hotel St. Charles, Dec. 3; Atlanta, Ga., Atlanta Biltmore Hotel, Dec. 8; Detroit, Mich., Hotel Statler, Dec. 11; Boston, Mass., Statler Hotel, Dec. 15; New York, N. Y., Merchants Assn. Rooms, 233 Broadway, Dec. 18; Chicago, Ill., Sherman Hotel, Jan. 5; St. Paul, Minn., St. Paul Hotel, Jan. 12; Seattle, Wash., Olympic Hotel, Jan. 19; Portland, Ore., Multnomah County Court Rooms, Jan. 22; San Francisco, Calif., Merchants Exchange, Room 237, Jan. 27; Los Angeles, Calif., California Railroad Commission Associated Realty Bldg., Feb. 2; Denver, Colo., Rooms of the Public Utilities Commission, Feb. 9; Omaha, Neb., Hotel Paxton, Feb. 14; Washington, D. C., Interstate Commerce Commission, March 4.

Weidenhoff Buys Apollo

CHICAGO, Nov. 19—Joseph Weidenhoff, Inc., has purchased the business of the Apollo Motor Gauge Co., according to an announcement.

General Motors Dealers Reduce Car Inventories

October Retail Sales Exceed Factory Shipments

NEW YORK, Nov. 20—Inventories of cars in the hands of General Motors dealers were reduced materially during October, it was announced today, in a statement by General Motors Corp. While dealers delivered 57,757 cars to customers in the United States during last month, the sales by General Motors manufacturing divisions to dealers in this country amounted to only 22,924 cars. This was due to the advancement of the date for model changes in certain of General Motors car lines as compared with a year ago.

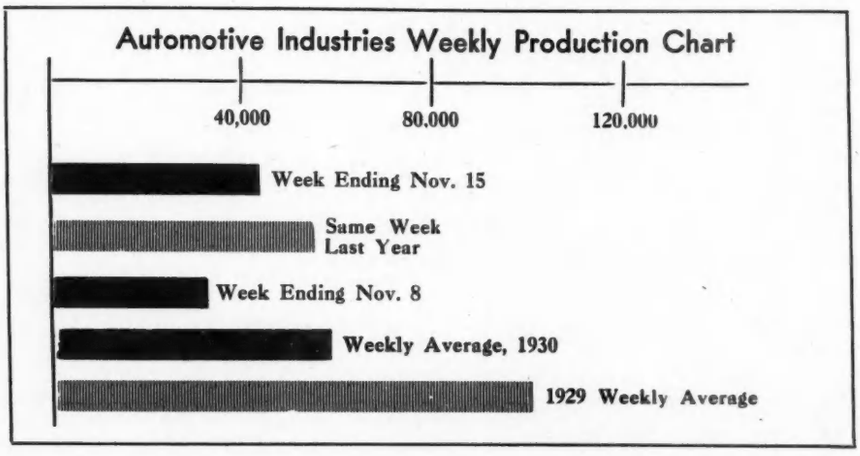
Total sales to dealers, including Canadian sales and overseas shipments, amounted to 28,253 cars, as compared with 122,104 in October, 1929.

The following table shows sales to consumers of General Motors cars in Continental United States, sales by the manufacturing divisions of General Motors to their dealers in Continental United States, and total sales to dealers, including Canadian sales and overseas shipments:

United States	Sales to Consumers		Sales to Dealers	
	1930	1929	1930	1929
Jan.	74,167	73,989	94,458	95,441
Feb.	88,742	110,148	110,904	141,222
Mar.	123,781	166,942	118,081	176,510
Apr.	142,004	173,201	132,365	176,634
May	131,817	169,034	136,169	175,873
June	97,318	154,437	87,595	163,704
July	80,147	147,079	70,716	157,111
Aug.	86,426	151,722	76,140	147,351
Sept.	75,805	124,723	69,901	127,220
Oct.	57,757	114,408	22,924	98,559

Total Sales to Dealers, Including Canadian Sales and Overseas Shipments	1930	1929
Jan.	106,509	127,580
Feb.	126,196	175,148
Mar.	135,930	220,391
Apr.	150,661	227,718
May	147,483	220,277
June	97,440	200,754
July	79,976	189,428
Aug.	85,610	168,185
Sept.	78,792	146,483
Oct.	28,253	122,104

Unit sales of Chevrolet, Pontiac, Oldsmobile, Marquette, Oakland, Viking, Buick, LaSalle and Cadillac passenger and commercial cars are included in the above figures.



Hudson Prices Lowest In Car's Long History

Advance Announcement Made to Aid Dealers

DETROIT, Nov. 17—Announcement of the prices on its line in advance of the showing or announcement of the new models is an innovation introduced by the Hudson Motor Car Co. this year. The prices on the 1931 line of Hudson Eights and Essex Super Sixes are the lowest in the history of this company, the base prices on both lines being even lower than those at which 1930 cars have been selling since the announcement of price reductions on Aug. 13.

The announcement by William J. McAneeny states that the base price of the Hudson line will be $875. This compares with $1,050 during the first half of 1930 (the five-passenger coach), and $885 during the latter half (the two-passenger coupe).

On the Essex the new base price is $595. This compares with a base price of $735 on the two-passenger coupe at the time of announcement of the 1930 line, and $650 on the same model and the coach following the August price cut.

The Essex base price compares with $535 for the lowest priced closed model (the two-passenger coupe) in the Chevrolet 1931 line, and with $665, the present base price on the Pontiac, since the reduction in August for cleanup purposes.

The pre-announcement of prices, according to the Hudson statement, was made in order to give distributors and dealers cooperation in preparing for an aggressive sales and merchandising campaign as soon as they receive the company's 1931 line later this month.

Another 1000 former Hudson employees were taken back to work today, bringing the total added during the last three weeks to 3500.

Ford of Canada Declares

DETROIT, Nov. 17 — Directors of Ford Motor Co. of Canada, Ltd., today declared the regular semi-annual dividend of 60 cents per share payable Dec. 22 to stockholders of record Dec. 1, according to announcement by Wallace R. Campbell, president. This action makes a total disbursement of $2.10 per share during 1930, the company having paid a dividend of $1.20 and an extra of 30 cents per share on June 23.

See Favorable Prospects

FLINT, MICH., Nov. 17 — Business prospects in the automobile field for the season of 1931 were reported extremely favorable at a meeting of the regional managers of the Buick Motor Company held at the factory in Flint this week, according to C. W. Churchill, general sales manager, who presided at the meeting. Plans for the 1931 season were discussed.

Elcar Action Dropped

ELKHART, IND., Nov. 18—Motion of Follansbee Bros., Pittsburgh, asking appointment of a receiver for the Elcar Motor Co., has been dropped on request of the plaintiff, according to a telegram to *Automotive Industries* from F. B. Sears, president and general manager of the Elcar organization. Institution of the receivership proceedings was reported in *Automotive Industries* for Oct. 11.

Ford's Airplane Work On 24-hr. Daily Basis

DETROIT, Nov. 17—The Ford airplane factory has been placed on a 24-hour-a-day working schedule, W. B. Mayo, head of the airplane division of the Ford Motor Co., announced today.

It is claimed that with more than three-quarters of a million dollars worth of business the factory output at the present production rate is now booked until next spring and more business is in prospect which can be accepted and handled expeditiously by stepping up output, Mr. Mayo said.

The plant is now employing more than 500 workers full time five days a week, whereas on Aug. 1, at the time of the announcement of the new high speed tri-motor plane, only 150 men were employed half time. The majority of the increased working force was called back during the last 60 days. Additional equipment is also being installed, Mr. Mayo said.

Martin Foundry Damaged

MILWAUKEE, Nov. 17 — Damage estimated at $50,000 was caused by fire in the foundry and core-room of the A. E. Martin Foundry & Machine Co., 1521 West Bruce St., Milwaukee, on Nov. 8. The company specializes in motorcycles and airplane engine castings and supplies the bulk of the castings to the Harley-Davidson Motorcycle Co., Milwaukee. Other buildings of the group will be converted to foundry purposes at once. Alex. E. Martin is president and treasurer.

Packard Electric Enters Canada

YOUNGSTOWN, OHIO, Nov. 17—The Packard Electric Co., through President Wolcott, has announced the opening of a factory in Canada due to increased business from Canadian automotive trade. The plant will be located in Toronto and will be fully equipped to manufacture all products in the Packard line.

Bendix Has New Brake Tester

CHICAGO, Nov. 19—A new medium duty all-purpose Cowdrey brake tester has been brought out by the Bendix-Cowdrey Brake Tester, Inc., South Bend, Ind., a subsidiary of the Bendix Aviation Corp.

Nash Advertises Delivered Prices

Begins New Policy for All Newspaper Copy

By Edwin McK. Johnson

KENOSHA, WIS., Nov. 17—Following tests in districts last year, and in response to widespread requests from dealers, Nash Motors Company is advertising delivered instead of factory list prices. The move is the result of a meeting of the Nash distributor committee in Kenosha, recently, at which an accord was reached on the proposal. Objection by one or two small distributors was overcome by majority opinion and the plan was agreed upon unanimously before the close of the sessions.

The plan affects newspaper advertising in local fields, but national advertising in magazines will either quote f.o.b. prices or none. Specific copy will be sent out by Green, Fulton, Cunningham, Chicago advertising agency, to the 47 distributing points in the United States and to Canadian distributors.

The delivered price policy will be advertised in all territories, as a result of agreement reached at the distributor committee conference.

The policy as worked out will require separate price listings in each territory, but as many of the territories are overlapping as regards delivery costs, there will be many cases in which the same price will prevail in more than one territory.

Mats which will be used in the advertising of delivered prices will bear the price for the distributing points to which they are sent. Since there are only 47 such points in the United States and some overlap, the project does not involve as many complications as the announcement of the new policy indicates. The distributing points will advertise the price which prevails in the whole territory served by that distributor.

Nash advertised delivered prices on its 1930 models in some districts, the Pacific Coast and others. It met with such success that the proposition was put before the distributor committee for united action.

Leard Consolidates Plants

NEW BRIGHTON, PA., Nov. 19—The William Leard Co., manufacturers of crankshafts and connecting rods, is moving its Ellwood City, Pa., plant in with the factory here, it is announced by William Leard, president. The Ellwood City plant will be abandoned.

Troy Trailer Co. Sold

TROY, OHIO, Nov. 17—The plant of the Troy Trailer & Wagon Co., together with the equipment and other assets, was sold at sheriff's sale to Marius Kirkeby, Chicago, president of the company, for $6,000.

Plymouth Includes Independent Shops In New Service Merchandising Campaign

DETROIT, Nov. 19—"The independent garage and service station has justified itself economically, is here to stay, and must be recognized as an important factor not only in the maintenance but also, indirectly, in the sale of automobiles," says Fred J. Rockelman, president, Plymouth Motor Corp., division of the Chrysler Corp. Interviewed regarding the initiation by Plymouth of a program of supplying independent repair shops with maintenance information on Plymouth cars, Mr. Rockelman continued:

"It probably would not have been possible to expand the automotive market to the extent it has reached if the servicing facilities offered by the independent repair shops and garage had not been available in addition to those maintained by the new car dealers. Far from being parasites on the industry, these repair shops, well managed and established on a sound business basis, have been of greater importance in building up and influencing automobile sales as a whole than has generally been appreciated."

"With the number of Plymouth owners increasing rapidly," Mr. Rockelman continued, "the independent garage and service station is coming more and more frequently into contact with these cars. The service shop thus becomes an important factor in formulating public opinion regarding our cars, and we feel that by assisting them in the matter of rendering more prompt and intelligent service, by making adjustments in the manner recommended by the factory service department, and by promoting the use by them of genuine parts, that good-will will be built not only for that service station but also for the car itself. Giving the independent repair shop a little more information on how to properly service our cars cannot but help build reputation for the Plymouth through satisfactory operation in the hands of the owner."

The initial maintenance chart supplied by the Plymouth to independent repair shops was devoted to the more common tune-up and service operations. It included data on value sizes and adjustment, carburetor and ignition adjustment, crankcase, transmission and rear axle lubricant capacities and recommendations, the same information on the cooling system, including antifreeze recommendations, brake adjustments, major engine specifications and front axle alignment. It included also a cutaway of the Plymouth engine.

"Our program," Mr. Rockelman explained, "is not to be construed as encouraging the servicing of Plymouth cars by independent service stations and garages rather than by the dealers handling our cars. Since, however, the independent has always serviced a sizable proportion of all makes of automobiles and there is every reason to believe that he will continue to do so, it is our function, as we see it, to enable him to better perform this service and reap thereby the benefit of increased owner satisfaction as well as the serviceman's goodwill."

Hein Buys Mueller Works

WAUKESHA, WIS., Nov. 17—The Mueller Engineering Works, Inc., Racine, Wis., a $100,000 corporation manufacturing hydraulic jacks from 1½-ton to 75-ton capacities, has been acquired by the Hein-Werner Motor Parts Corp., Waukesha, and consolidation of the plants in Waukesha is now under way. Plans are being made for an addition to the Hein-Werner plant, although work may not begin until spring. The Hein-Werner company is closely identified with the Waukesha Motor Co.

The Mueller company controls important patents on hydraulic jack features. J. J. Mueller and D. J. Mueller, principals in the Racine company, have become associated with the Hein-Werner engineering staff.

Franklin Sales Increase

SYRACUSE, Nov. 17—Retail deliveries of Franklin cars during the week of Nov. 2 were 15 per cent over the previous week and reached the highest week's total deliveries since the first week in June, President H. H. Franklin announced here today. This was also 30 per cent greater than the corresponding week of 1929, Mr. Franklin said, and was the first week since April to show a gain over the corresponding week of the previous year. Shipments to dealers this month to date exceed shipments over the same period of October by 75 per cent.

Gramm Adds Two Models

DELPHOS, OHIO, Nov. 17 — Two models, 330 and 331, are offered by Gramm Motors, Inc., in its new 3-ton range series E. Both models are straight rated at 20,000 lb. and come in two standard wheelbases—160 and 175 in.

The engine is a 3⅞ x 5-in. Lycoming model TS six, developing 100 hp. It is mounted in unit with a dry plate clutch and four-speed Covert transmission. Gasoline is fed by mechanical pump from a 24-gal. tank located under the seat to a Zenith carburetor equipped with an air cleaner. Starting, lighting and ignition are furnished by Auto-Lite equipment.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, Nov. 19—Both wholesale and retail trade were retarded last week by the warm weather, while industry in general lagged. On the whole, however, a great deal more optimism regarding general business was noticeable, based on the better tone in the stock market, the improvement in some commodity prices, and encouraging statements by many business leaders.

GUARANTY INDEX

The preliminary business index of the Guaranty Trust Co. for October stood at 69.3, as against 72.2 for the preceding month and 101.0 a year ago.

DEPARTMENT STORE SALES

Department store sales during October, according to a preliminary report of the Federal Reserve Board, were 8 per cent below those a year ago, while sales during the first 10 months of this year were 7 per cent below those in the corresponding period last year.

CHAIN STORE SALES

Sales of 41 store chains during October were 7.9 per cent below those a year ago, although they were 16.1 per cent above those in the preceding month.

CRUDE OIL OUTPUT

Average daily crude oil production during the week ended Nov. 8 amounted to 2,297,250 bbl., as against 2,363,050 bbl. for the preceding week and 2,631,200 bbl. a year ago.

FARM PRICES

The index of the general level of farm prices on Oct. 15 stood at 106, as against 101 a month earlier and 140 a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Nov. 15 stood at 82.2, as against 82.2 the week before and 82.4 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Nov. 12 were 30 per cent below those in the corresponding period last year. The stock market at the beginning of last week continued very depressed, and a new break in both the grain and cotton markets had the effect of increasing the weakness. With improvement in the price of copper and with other favorable reports, the market reversed its trend; and recovery during the remainder of the week was sufficient to bring most issues above their levels at the beginning of that period.

FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended Nov. 12 showed an increase of $21,000,000 in holdings of bills bought in the open market.

Truck Sales Are Bright Spot in Survey of Foreign Markets

WASHINGTON, Nov. 19 — Market conditions in 10 foreign countries during the third quarter of this year will be reported by A. W. Childs, chief of the automotive division of the Bureau of Foreign and Domestic Commerce, in the Nov. 24 issue of Commerce Reports. These reports will constitute Part 1 of a series covering the principal automotive markets of the world. The first ten issued appear below. Detailed information about any of the countries mentioned may be obtained by firms listed in the Exporter's Index, from the Automotive Division.

Belgium

The decline in automobile sales which became noticeable in June, was accentuated throughout July and August. The leading factor in the decline was the continuation of the industrial crisis combined with the vacation period. Imports of complete cars dropped from a monthly average of 833 during the second quarter to 544 in July and 554 in August.

Competition during the present year has been entirely in favor of the cheap car.

In the truck field the outstanding point of interest has been the competition of cheap trucks with more expensive makes.

China

Automotive sales were adversely affected in Hong Kong and South China during the third quarter as a result of the depreciated value of silver and the uncertain political situation. The decreased activity in road building activities and the internal warfare in the province of Kwangsi practically closed the market for motor vehicles. It is estimated that 1930 sales of passenger cars in South China have registered at least a 50 per cent drop as compared with 1929.

The market for light truck chassis to which are fitted locally built bodies for bus service has been the one bright spot in the automotive market.

Colombia

Purchase of automotive vehicles in Colombia during the third quarter were very dull, owing to the serious economic depression which prevailed throughout the country. Distributors of American-made low-priced cars sold a reasonable number of units but the total is considerably below the corresponding quarter of 1929.

It was estimated at the close of the quarter that dealers in all parts of the country had approximately 650 low and medium-priced automobiles and trucks on hand. Numerous automobiles have been retired from operation apparently without having disturbed the used car market.

Cuba

Many owners of automobiles were financially unable to pay for the registration of their cars within the two months' period allowed at the first of the fiscal year and as a result nearly 2000 fewer cars were registered in Habana by Aug. 31, 1930, than were registered at the same time in 1929.

While sales for all type passenger cars were slow during the quarter, the low-priced machines have been in a relatively better position than other classes of cars. The medium and high-priced automobiles have both been seriously affected in the current business depression though relatively the latter group has been slightly less affected than the former.

Most distributors are finding the used car problem very serious and many of them are overstocked. Garages and taxicab drivers offer the best market for used cars.

Denmark

Total registrations of passenger cars through the first three quarters aggregated about 11,460 units as contrasted with 8840 units for the corresponding period of the previous year, an increase of nearly thirty per cent. European competition has dropped off somewhat and whereas at the end of September, 1929, the sales of cars of other than American make represented about 10 per cent of the total, this year's figure is closer to 8 per cent.

Dealers stocks of both passenger cars and trucks were reported to be low. Stocks of used cars are above normal and are of some concern. Approximately 70 per cent of passenger car sales and 80 per cent of truck sales involve trade-ins. Sales of motorcycles have risen considerably as compared with last year.

Germany

In the third quarter of 1930, the German passenger car market fell off decidedly. In the month of August only 280 units were sold daily as compared with 358 in July and higher figures in the previous quarter. The greater part of sales were confined to cheaper 4 and 6-cylinder models. An increasing proportion of business is being secured by low-priced American and German cars.

The market for trucks is depressed more than that of passenger cars. Registrations of trucks on July 1 was 157,482, a gain of 13,480 in the last fiscal year as compared with a gain of 20,796 in the previous fiscal year. Foreign trucks accounted for approximately 40 per cent of sales and most of these were of two well-known makes. Sales of parts and accessories held up well with the general tendency toward the increased proportion of American materials used.

Peru

The great depreciation in currency forced a general increase in automobile prices. Credit sales have been difficult to arrange on account of the fluctuations of the sol. Imports, however, continued about the same as during the two previous quarters, demonstrating that importations have about reached a low-water mark. Stocks are low from a numerical standpoint, but according to the present rate of sales they are ample to meet all requirements.

The best single outlet for automobiles has been for low-priced touring cars for use as taxis. Initial low cost has been the greatest inducement for sales of these cars but with the increasing prices the demand for new cars to be placed into taxi service has practically ceased to exist.

Poland

At the close of the third quarter, sales of automobiles were approximately 40 per cent below those of the corresponding period of 1929. Stocks of imported cars were, as usual, comparatively low, mainly because dealers are not financially able to carry more than their probable immediate needs.

Reports from the trade indicate that bus sales during the first 9 months of 1930 were only slightly below last year, but the buying preference this year has been almost wholly for light jobs. Dealers state that they receive many inquiries for big bus chassis which they have to turn down because they are not willing or able to carry the risk involved.

As in the case of buses, truck sales are not far behind 1929 figures, although registration figures on July 1, 1930, showed only an increase of 150 units over those of Jan. 1, 1930. Purchases of American-made trucks were almost exclusively of low-priced jobs. European competition in the heavier types is very keen.

The brightest feature of the motor vehicle market was in the motorcycle trade. Imports have been one-third greater than in 1929.

Portugal

The demand for motor cars continues to be principally for low-priced machines while sales of medium-priced cars were reported to be increasingly difficult. Sales of new cars involving trade-ins are growing and dealers are experiencing considerable difficulty in disposing of used cars.

Bus sales have been smaller than in 1929 owing to the prevailing economic and financial situation. However, the use of buses is increasing slowly as more improved roads are being constructed. At present very few buses with bodies are imported into the country.

The number of trucks in the country is constantly increasing and the percentage of increase is greater than that of passenger cars. Sales of trucks have not been curtailed as much as those of passenger cars in the present financial stringency.

Yugoslavia

While July was a good month for most automotive dealers, in August there was very little business and the anticipated improvement in September was delayed longer than usual.

Stocks of new and used cars were low as usual. Dealers were reported as resorting to price-cutting and finance companies were operating on rates as high as 15 to 16 per cent.

Demand for light American-made trucks continued to command a good share of the total business available. European producers were able to secure the heavy truck market.

New Stutz Issue Listed at Chicago

210,649 No Par Shares Entered on Board

CHICAGO Nov. 15—The governing committee of the Chicago Stock Exchange yesterday approved the listing of 210,649 shares of no par value common stock of the Stutz Motor Car Co. of America. The common stock is authorized in the amount of 400,000 shares, of which 111,674 shares will presently be outstanding, the issued stock to consist of 29,674 shares which are being exchanged for the stock now outstanding on a ten-for-one basis, and 81,974 shares which have been sold to L. L. Harr & Co. and which will be marketed by them at $16 a share.

The bankers have an option to buy 54,444 shares and 29,674 shares are reserved for the exercise of warrants issued to stockholders of record Oct. 15, last, to purchase stock at $27.50 a share. The remaining 14,883 shares which are included in the present listing are reserved for the conversion of the outstanding 7 per cent debentures in the ratio of 33 shares for each $1,000 debenture.

The committee also approved the listing of 225,000 shares of common stock of the Muskegon Motor Specialties Co., represented by certificates of deposit. The listing of 312,500 shares of common stock of the Hercules Motor Corp. and 100,000 shares of Ohmer Fare Register Co. were approved also.

Stewart-Warner Ratio Good

CHICAGO, Nov. 17 — A continued strong financial position is revealed by the consolidated balance sheet of Stewart-Warner Corporation and subsidiaries as of Sept. 30, last, which was sent to stockholders Friday, Nov. 14. Current assets aggregated $13,101,650, of which $4,772,463 was in cash, as against current liabilities of $1,606,606, including Federal tax reserves.

Traffic Managers Meet

DETROIT, Nov. 17 — The regular monthly meeting of the traffic managers, members of the National Automobile Chamber of Commerce, at Detroit, Nov. 13, was devoted mostly to consideration of ocean freight rates on cars, trucks and parts in the export trade during 1931. The steamship lines renew their contracts annually and all present rates expire Dec. 31.

Chrysler Wins Decision

CHICAGO, Nov. 17 — A decree has been entered by the Federal court in San Francisco holding that automobile seat construction used on Chrysler automobiles is not infringing on patent No. 1,151,910, issued to George F. Sturges.

+ + CALENDAR + + OF COMING EVENTS

SHOWS

New York, National Automobile..Jan. 3-10
National Roadbuilders' Show and Convention, St. Louis .....Jan. 10-16
Buffalo, N. Y., Automobile.....Jan. 10-17
Newark, N. J., Automobile.....Jan. 10-17
Milwaukee, Wis., Automobile ..Jan. 10-18
Cincinnati, Automobile .....Jan. 11-17
Baltimore, Automobile .....Jan. 17-24
Boston, Automobile .....Jan. 17-24
Hartford, Conn., Automobile ..Jan. 17-24
Montreal, Automobile .....Jan. 17-24
Detroit, Mich., Automobile.....Jan. 17-24
Pittsburgh, Pa., Automobile ...Jan. 17-24
Louisville, Automobile .....Jan. 19-24
Rochester, Automobile .....Jan. 19-24
Washington, D. C., Automobile..Jan. 24-31
Chicago, National Automobile...Jan. 24-31
Cleveland, Ohio, Automobile....Jan. 24-31
Los Angeles, Calif., Automobile, Jan. 24-Feb. 1
Portland, Me., Automobile .....Jan. 26-31
Springfield, Mass., Automobile..Jan. 26-31
Syracuse, N. Y., Automobile....Jan. 26-31
Minneapolis, Minn., Automobile..Feb. 1-8
San Francisco, Calif., Automobile, Feb. 1-8
St. Paul, Minn. (Joint show with Minneapolis) .....Feb. 1-8
St. Louis, Mo., Automobile.....Feb. 2-7
Camden, N. J., Automobile, Feb. 25-March 2
Denver, Automobile .....Feb. 9-14
St. Petersburg, Fla., Automobile.Feb. 9-14
Peoria, Ill., Automobile.....Feb. 11-15
Rapid City, S. D., Automobile..Feb. 12-16
Indianapolis, Ind., Automobile..Feb. 14-19
Quebec, Automobile .....Feb. 21-28
Des Moines, Automobile .....Feb. 23-28
International Garage Exposition, Berlin, Germany .....May 9-Aug. 9

CONVENTIONS

Annual Asphalt Paving Conference, Memphis, Tenn. .....Dec. 1-5
National Power and Mechanical Engineering Exposition, New York City .....Dec. 1-6
First International Aerial Safety Congress, Paris, France .....Dec. 10-23
Highway Research Board, Washington .....Dec. 11-12
National Research Council, Washton, D. C. .....Dec. 11-12
Society of Automotive Engineers, Annual Dinner, New York .....Jan. 8
Society of Automotive Engineers, Annual Meeting, Detroit....Jan. 19-23
Natl. Association of Engine & Boat Manufacturers, New York City, Jan. 23
Natl. Paving Brick Mfg. Association, Pittsburgh, Pa. .....Feb. 4-6
A. S. M. E. Fuels Meeting, Chicago, Feb. 11-13
Society for Steel Treating (National Western Metal and Machinery Exposition), San Francisco..Feb. 16-20
Road Show and School, Wichita, Feb. 24-27
American Chemical Society, Indianapolis, Ind. .....March 30-April 4
U. S. Chamber of Commerce, Atlantic City ... ...April 28-May 1

SALONS

Paris, France, Salon (Commercial Vehicles) .....Nov. 13-23
New York, Commodore Hotel, Nov. 30-Dec. 6
Brussels, Belgium, Salon.....Dec. 6-17

EVENTS DURING NEW YORK SHOW WEEK

Pierce-Arrow, Luncheon, Plaza Hotel, Jan. 3
Franklin Mfg. Co., Luncheon, Commodore .....Jan. 5
Auburn Automobile Co., Luncheon, Commodore .....Jan. 6
Marmon Motor Car Co., Luncheon, Commodore .....Jan. 7

EVENTS DURING CHICAGO SHOW WEEK

Pierce-Arrow, Luncheon, Stevens..Jan. 26
Franklin Mfg. Co., Luncheon, Blackstone .....Jan. 26
Auburn Automobile Co., Luncheon, Stevens .....Jan. 27
Marmon Motor Car Co., Luncheon, Palmer House .....Jan. 28

Lycoming Develops 8-cyl. Truck Engine

One Type Permits Mounting Compressor

WILLIAMSPORT, PA., Nov. 18—Two new eight-cylinder engines for commercial vehicles have been developed by the Lycoming Manufacturing Co. They are referred to collectively as the AE series and are both of the same cylinder dimensions, one, the AED, differing from the other, the AEC, in that it has provisions for mounting a 6 cu. ft. Westinghouse air compressor. When an air compressor is used the generator, which is of the base-mounted type, is driven through the compressor.

These AE series engines are of the in-line type with L-head cylinders of 3¾-in. bore by 4¾-in. stroke, making their displacement 420 cu. in. They develop a maximum torque of 305 lb.-ft. at 1200 r.p.m. and an output of 130 hp. at 2800 r.p.m. The crankshaft is supported in five main bearings varying in diameter from 2 to 2¾ in. Inlet valves of chrome nickel steel and exhaust valves of silchrome are used. All cylinders and the major portion of the crankcase are in a single casting of chromium iron. A modified three-point mounting is used for the engine, with a rubber block at the front. The weight of the complete engine is approximately 950 lb.

Stoll Co. is Reorganized

LA CROSSE, WIS., Nov. 17—The Stoll Mfg. Co., 2126 South Avenue, La Crosse, Wis., has incorporated its business as the Stoll Mfg. Co., Inc., with a capital stock of $60,000, following the death of Matthew N. Stoll, founder and president. Mrs. Agnes Stoll, the widow, will be associated with Albert Arenz and George J. Schelbe in the conduct of the business. The concern manufactures automotive equipment, tools, dies, jigs, etc.

Federal Rubber Resumes

MILWAUKEE, Nov. 17—Increased demand for motorcycle and bicycle tires has prompted the Federal Rubber Co., division of the Fisk Rubber Co., to increase the operating force at its plant in Cudahy, suburb of Milwaukee, to 250. The plant was closed, save for the bicycle department, in June, and 1200 were laid off indefinitely at that time.

Salon Sales Improve

CHICAGO, Nov. 17 — Chicago's sixteenth annual automobile salon from the standpoint of actual sales and prospects was far ahead of the 1929 salon. Total sales for the week approximated $500,000, which is more than double the mark set last year. More than 80 custom-built models valued at over $700,000, were shown.